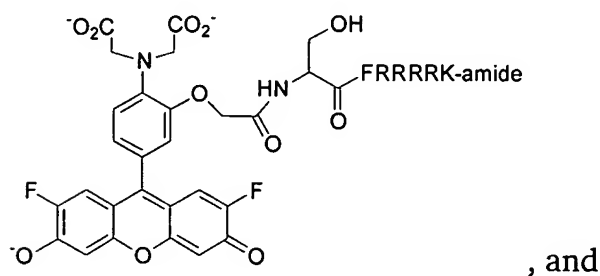
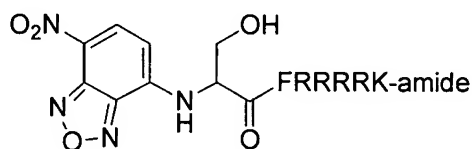


Amendments to the Claims:

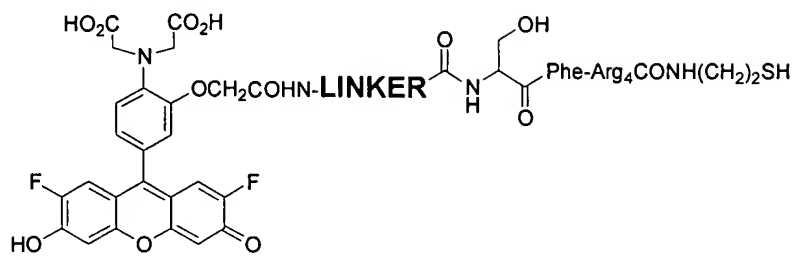
Please cancel Claims 103-121 and 144-145 without prejudice or disclaimer, and amend Claims 49, 56, 60-61, 88, 129 and 133 as set forth below.

1-48. (Canceled)

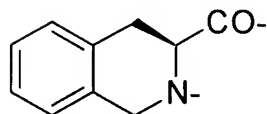
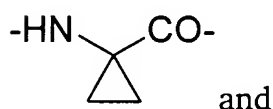
49. (Currently amended) A substrate for a protein kinase, ~~wherein the substrate comprises a peptide and at least one fluorophore, wherein a fluorophore is attached to a serine, a threonine, or a tyrosine on at least one terminal end of the peptide, wherein phosphorylation by the protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% change in fluorescence intensity, and~~ wherein the substrate is selected from the group consisting of:



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wherein F is phenylalanine, K is lysine, and R is arginine; and wherein the LINKER is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



50-55. (Canceled)

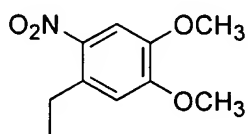
56. (Currently amended) A substrate for a protein kinase, wherein the substrate comprises:

a peptide substrate for the protein kinase, wherein the peptide comprises ~~comprising~~ a serine, a threonine, or a tyrosine on a terminal end of the peptide;

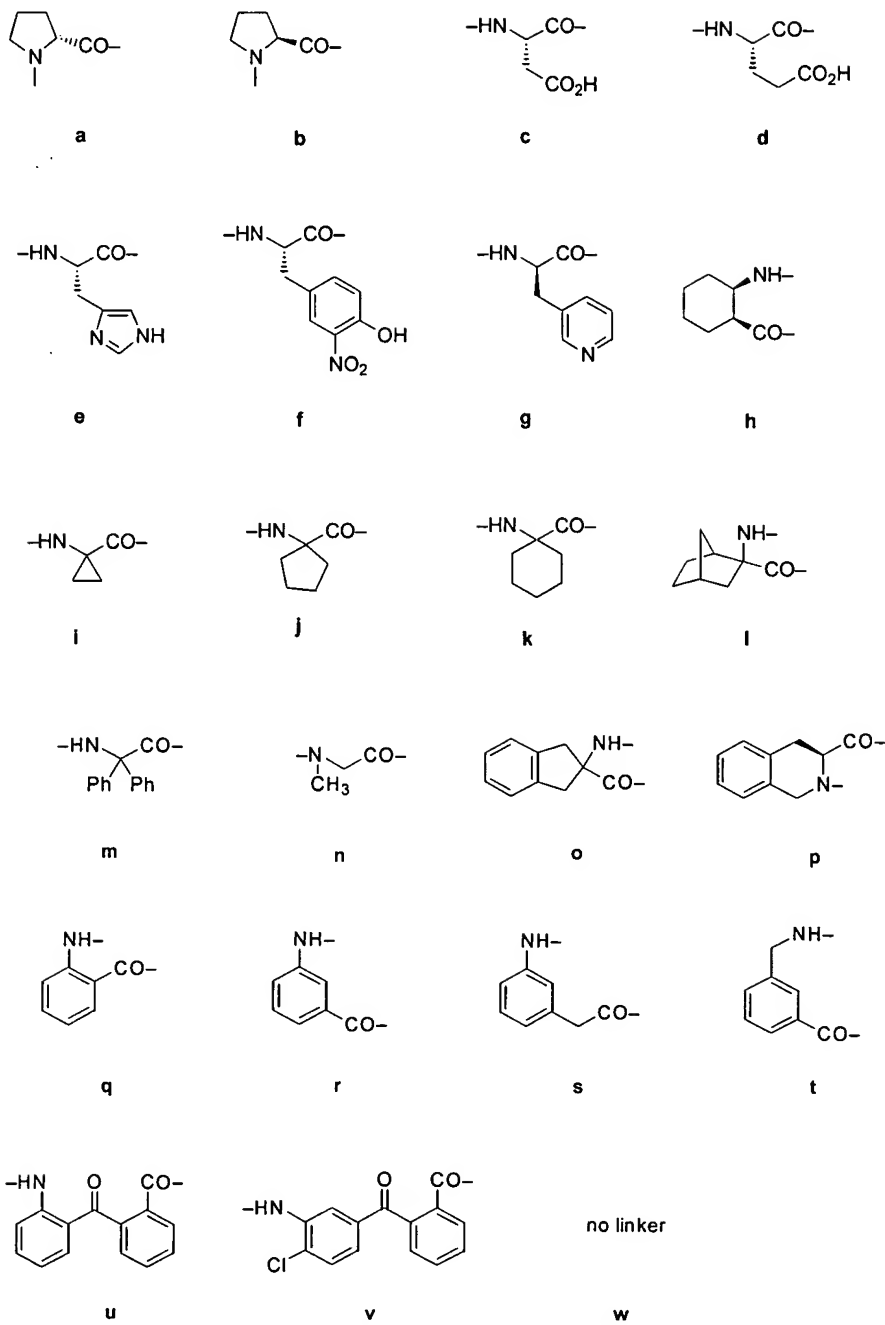
at least one fluorophore, wherein a fluorophore is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide; and

a photolabile side chain attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide, wherein the photolabile side chain blocks transfer of a phosphoryl group from adenosine triphosphate to a hydroxyl moiety of the serine, the threonine, or the tyrosine so that the substrate cannot be phosphorylated by a protein kinase until the photolabile side chain is removed from the substrate; and

wherein the ~~the~~ photolabile side chain comprises the structure



or a fluorophore is attached to the peptide by a linker selected from the group consisting of



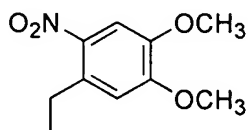
; and

wherein

- (i) the substrate is specific for a protein kinase subtype,
- (ii) the fluorophore is attached to the C-terminal end of the peptide,

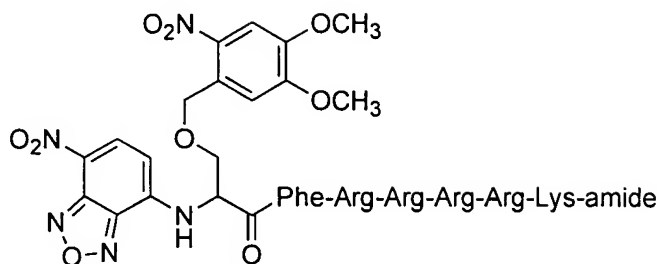
- (iii) a fluorophore is attached to each terminal end of the peptide,
- (iv) a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide,
- (v) the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative,
- (vi) the fluorophore is attached to the peptide by a linker selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker, and/or
- (vii) the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

57. (Original) The substrate of claim 56, wherein the photolabile side chain comprises the structure



58. (Original) The substrate of claim 56, wherein the substrate comprises a serine with a photolabile side chain that blocks phosphoryl transfer.

59. (Original) The substrate of claim 58, wherein the substrate has the structure



60. (Original) The substrate of claim 56, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% change in fluorescence intensity.

61. (Currently amended) The substrate of claim 56, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% increase in fluorescence intensity. ~~The substrate of claim 60, wherein the change in fluorescence intensity when the substrate is phosphorylated by the protein kinase is an increase in fluorescence intensity.~~

62. (Currently amended) The substrate of claim 56, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% decrease in fluorescence intensity. ~~The substrate of claim 60, wherein the change in fluorescence intensity when the substrate is phosphorylated by the protein kinase is a decrease in fluorescence intensity.~~

63. (Previously presented) The substrate of claim 60, wherein phosphorylation of

the substrate by the protein kinase produces at least a 70% change in fluorescence intensity.

64. (Original) The substrate of claim 63, wherein phosphorylation of the substrate by the protein kinase produces at least a 100% change in fluorescence intensity.

65. (Original) The substrate of claim 64, wherein phosphorylation of the substrate by the protein kinase produces at least a 150% change in fluorescence intensity.

66. (Original) The substrate of claim 65, wherein phosphorylation of the substrate by the protein kinase produces at least a 250% change in fluorescence intensity.

67. (Previously presented) The substrate of claim 56, wherein the substrate is specific for a protein kinase subtype.

68. (Original) The substrate of claim 67, wherein the substrate is specific for protein kinase C.

69. (Original) The substrate of claim 68, wherein the substrate is specific for isoforms  $\alpha$ ,  $\beta$ , and  $\gamma$  of protein kinase C.

70. (Withdrawn) The substrate of claim 67, wherein the substrate is specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G,  $\text{Ca}^{+}$ /calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2

kinase.

71. (Previously presented) The substrate of claim 56, wherein the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

72. (Canceled)

73. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the C-terminal end of the peptide.

74. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the N-terminal end of the peptide.

75. (Previously presented) The substrate of claim 56, wherein a fluorophore is attached to each terminal end of the peptide.

76. (Original) The substrate of claim 75, wherein fluorophores with distinct photophysical properties are attached to different terminal ends of the peptide.

77. (Previously presented) The substrate of claim 56, wherein a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide.

78. (Previously presented) The substrate of claim 56, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.



79. (Withdrawn) The substrate of claim 56, wherein the fluorophore is a fluorescein derivative.

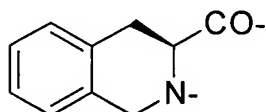
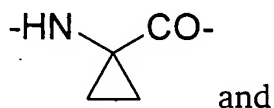
80. (Withdrawn) The substrate of claim 56, wherein the fluorophore is selected from the group consisting of a dansyl derivative, an acridine derivative, an Alexa Fluor derivative, a BODIPY derivative, an Oregon Green derivative, a Rhodamine Green derivative, a Rhodamine Red-X derivative, a Texas Red derivative, a Cascade Blue derivative, a Cascade Yellow derivative, a Marina Blue derivative, a Pacific Blue derivative, an AMCA-X derivative, and a coumarin derivative.

81. (Canceled)

82. (Withdrawn) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a metal chelating linker.

83. (Previously presented) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

84. (Withdrawn) The substrate of claim 56, wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of N-methyl glycine, L-proline, D-proline,

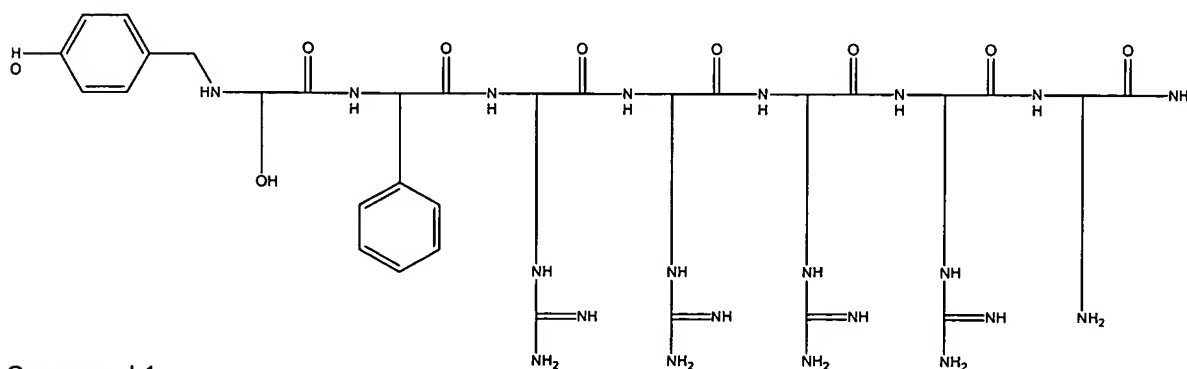


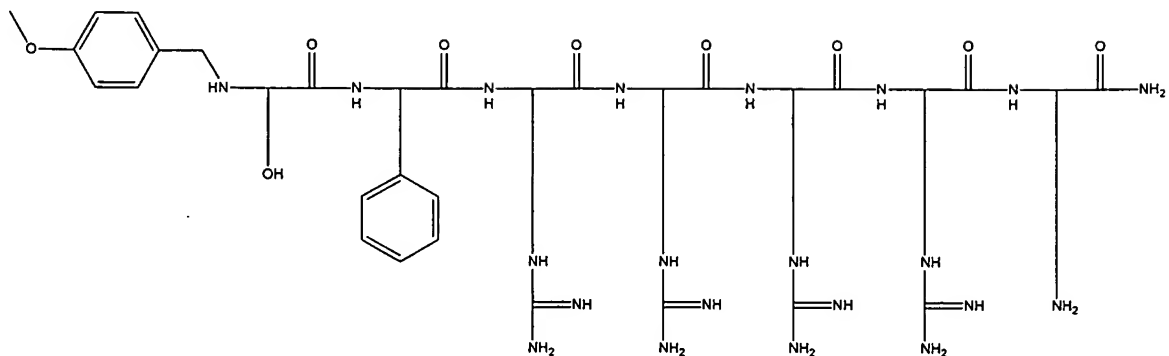
85. (Canceled)

86. (Previously presented) A composition comprising the substrate of claim 56, and a carrier.

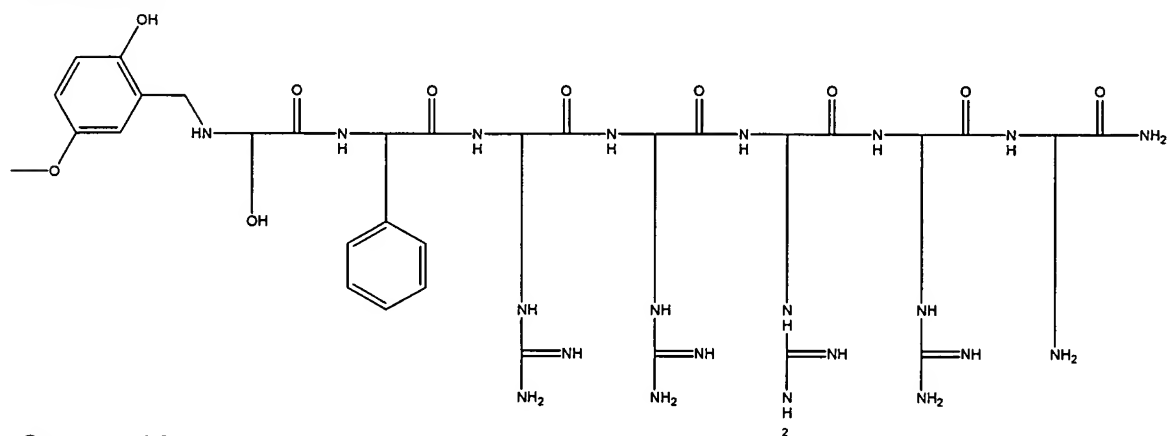
87. (Original) The composition of claim 86, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

88. (Currently amended) A chemical compound selected from the group of compounds consisting of: ~~set forth in Table 3.~~

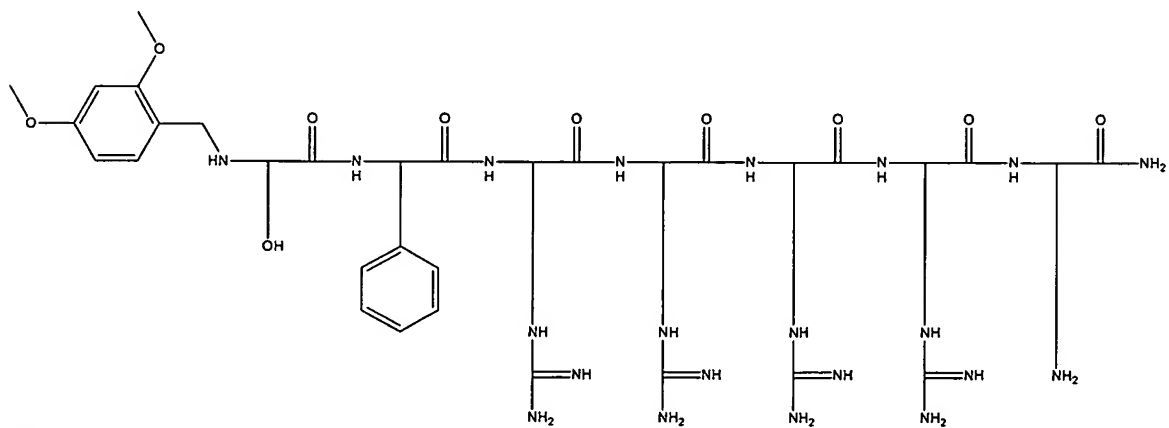




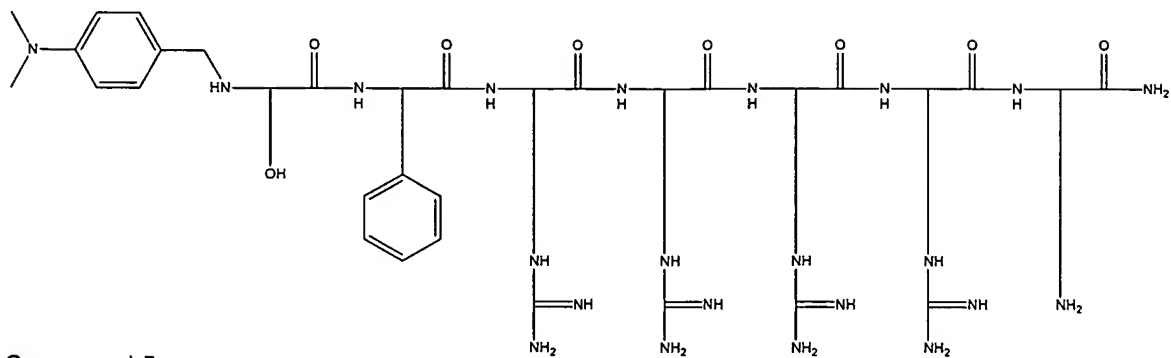
Compound 2



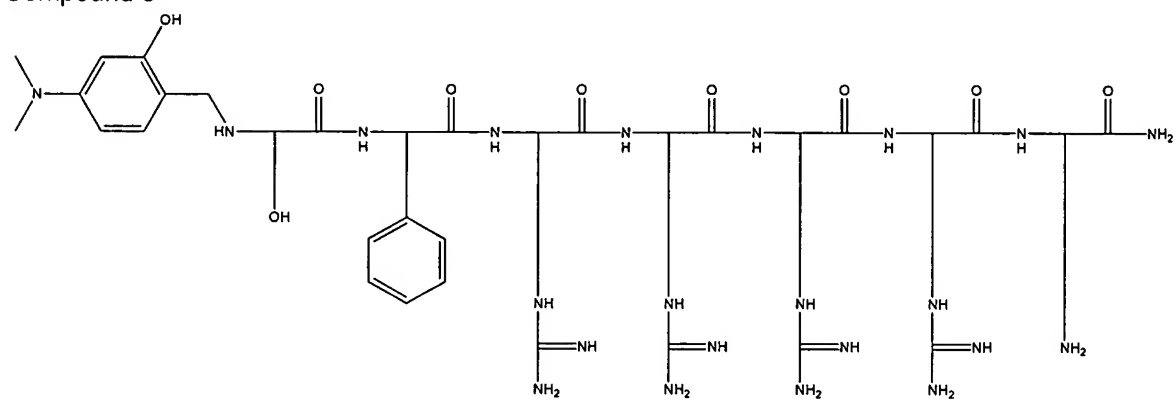
Compound 3



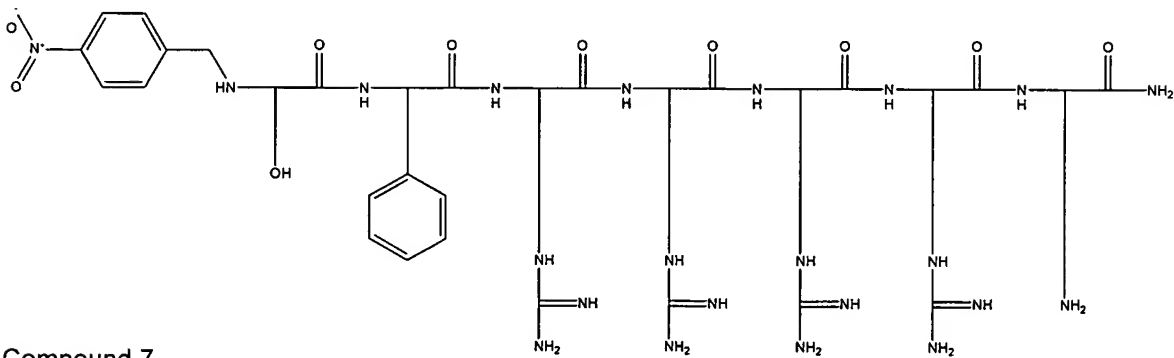
Compound 4



Compound 5

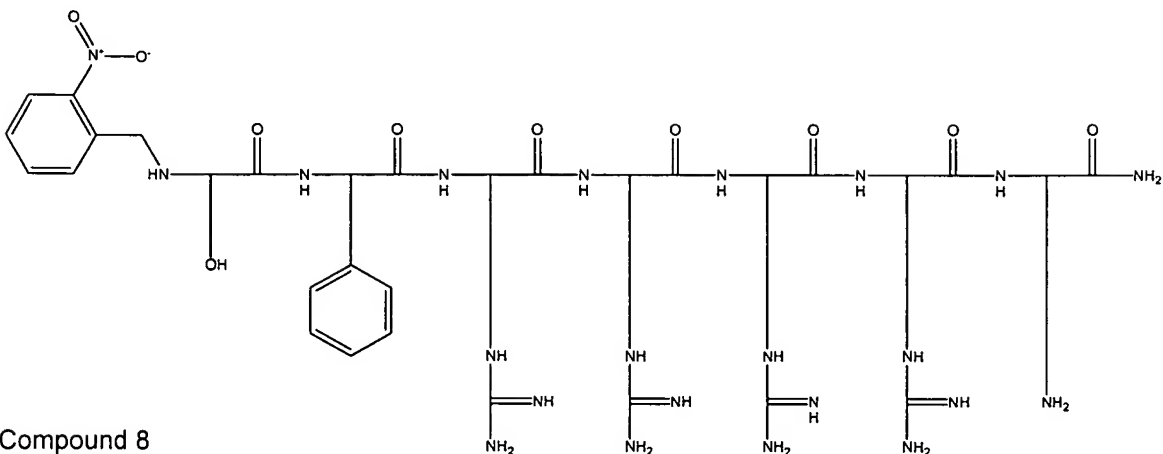


Compound 6

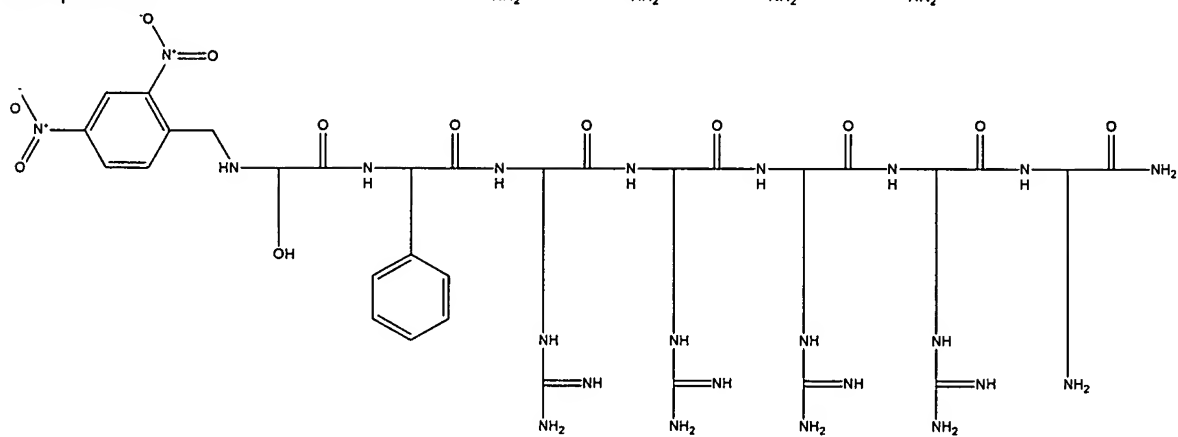


Compound 7

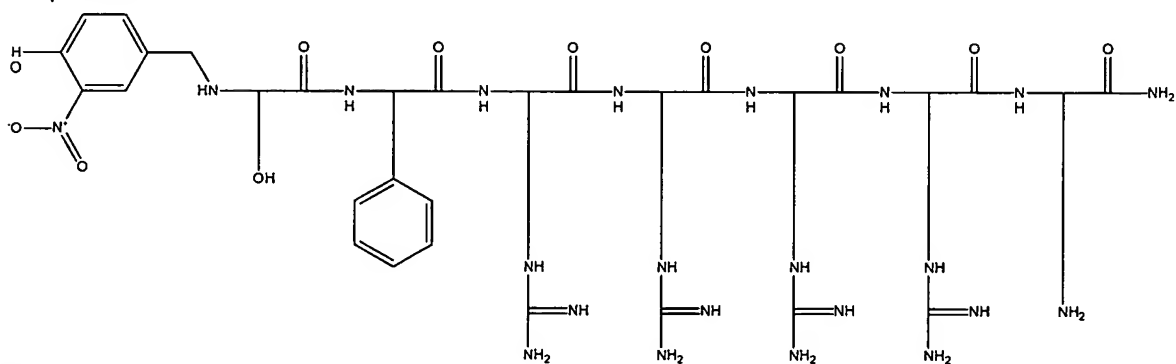
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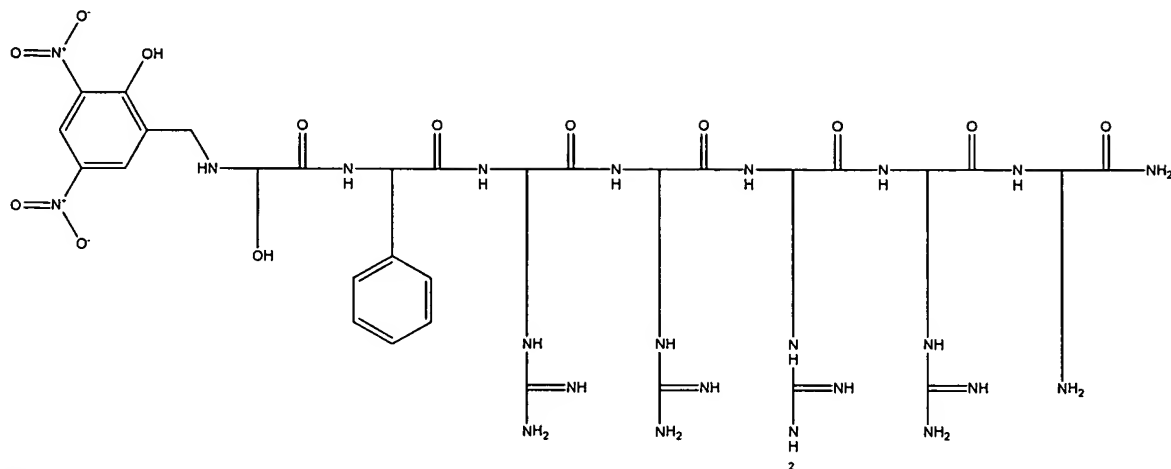
Compound 8



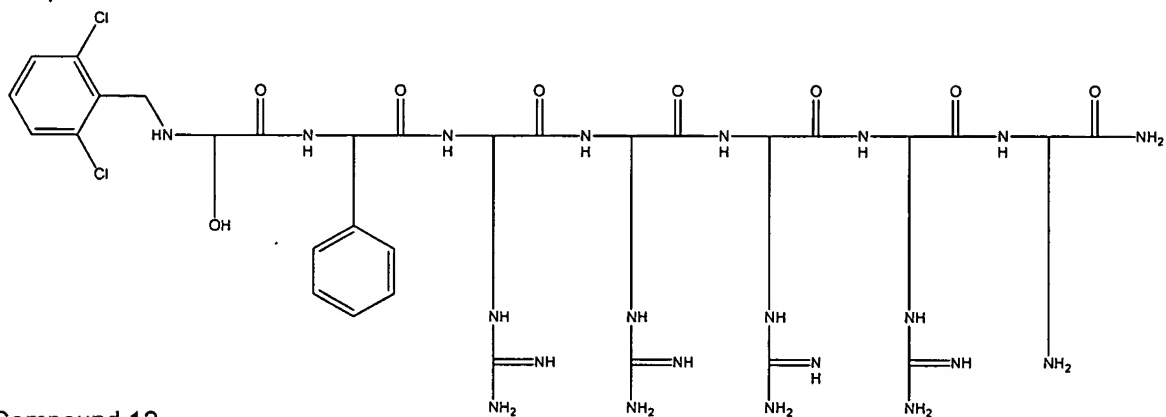
Compound 9



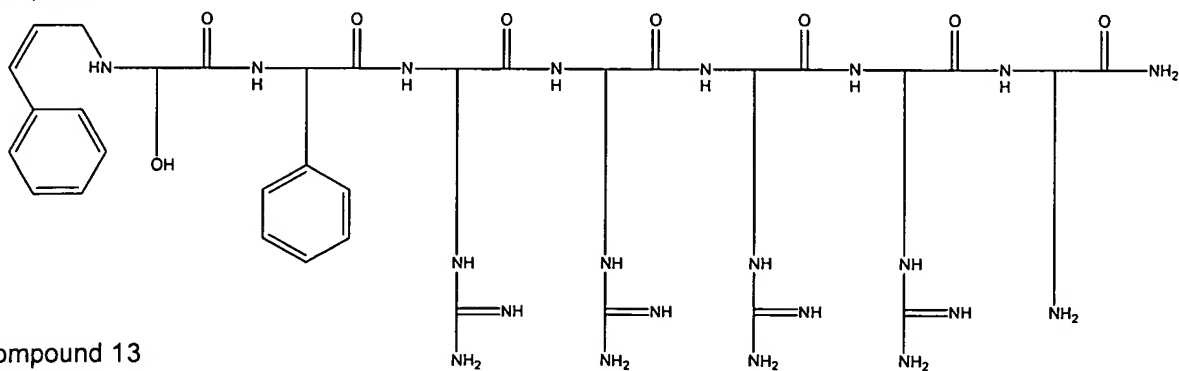
Compound 10



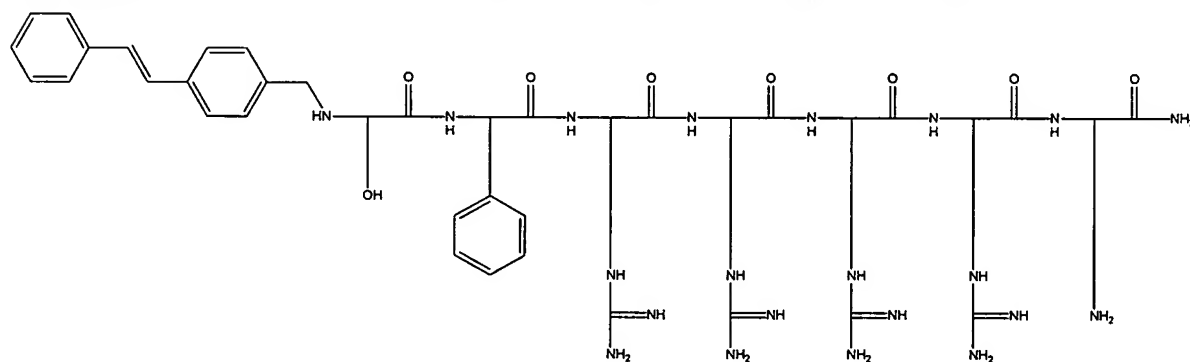
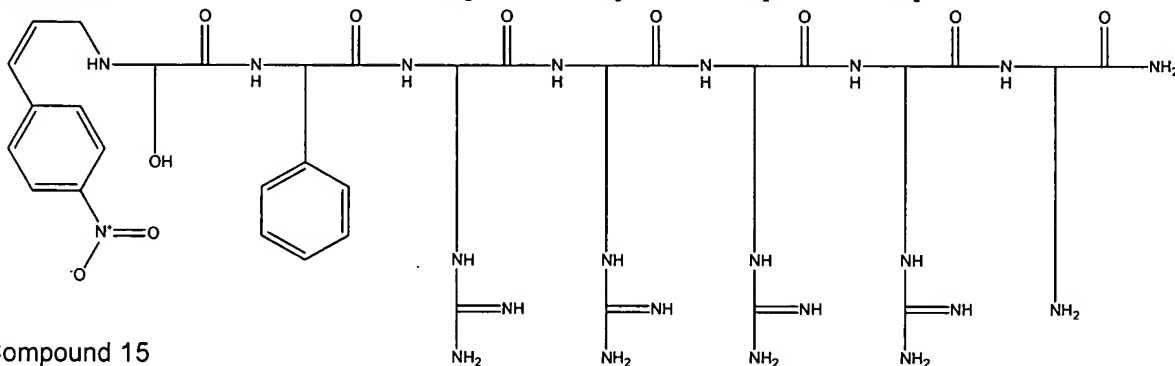
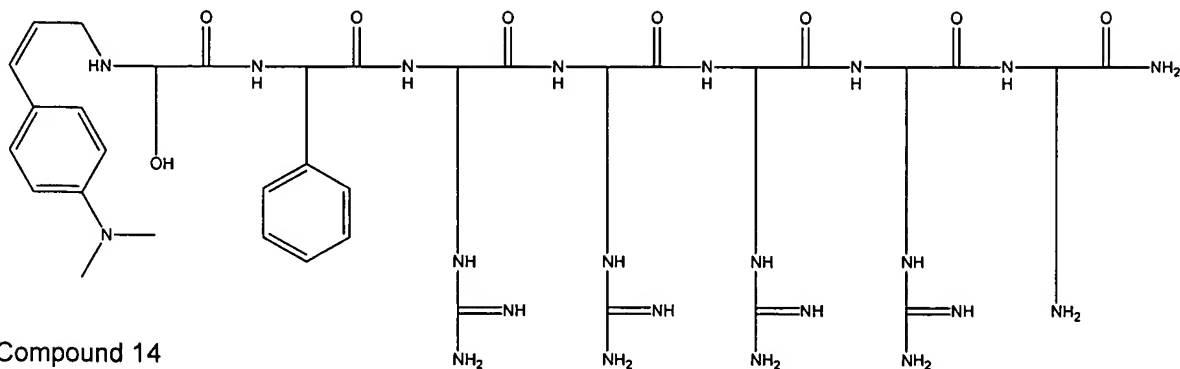
Compound 11

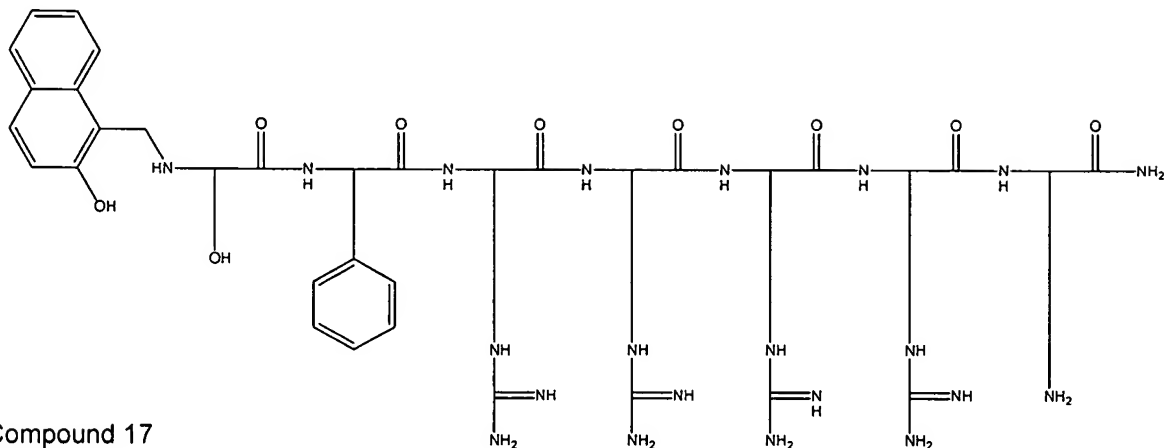


Compound 12

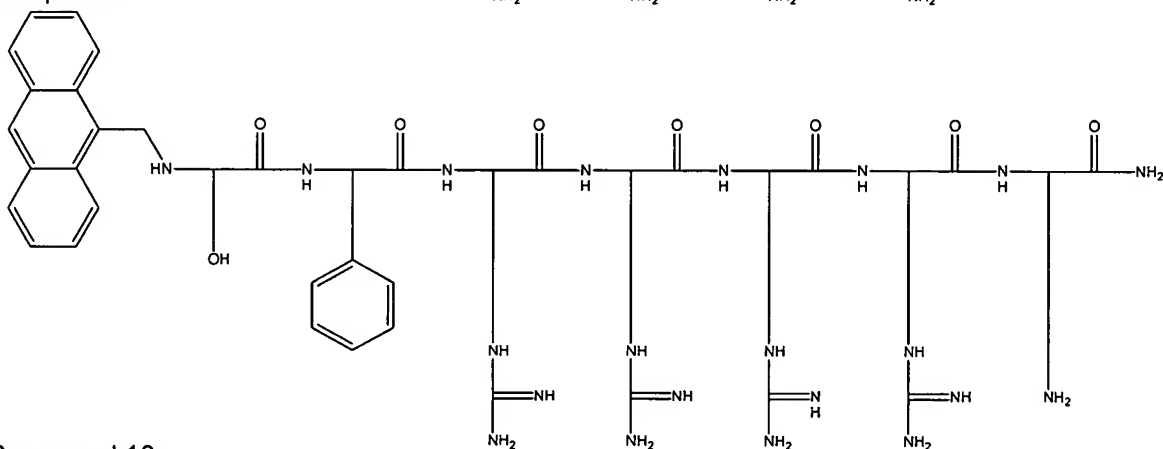


Compound 13

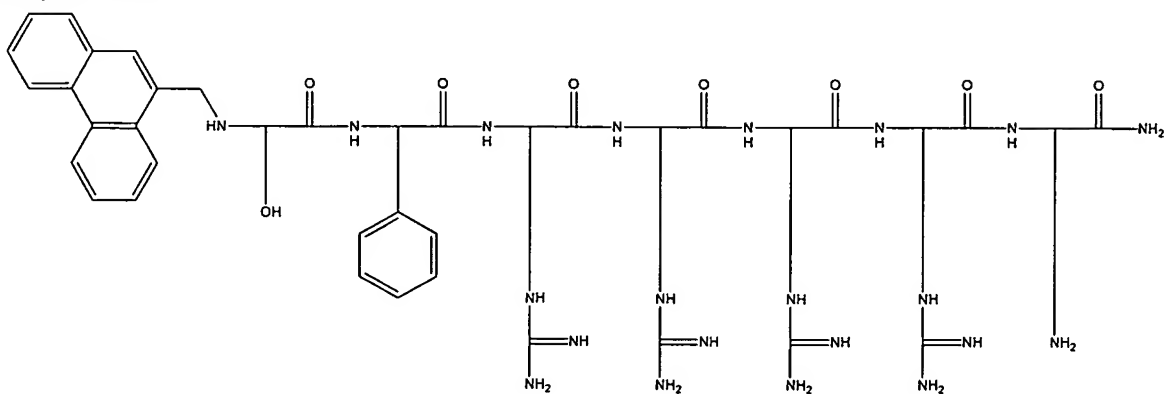




Compound 17



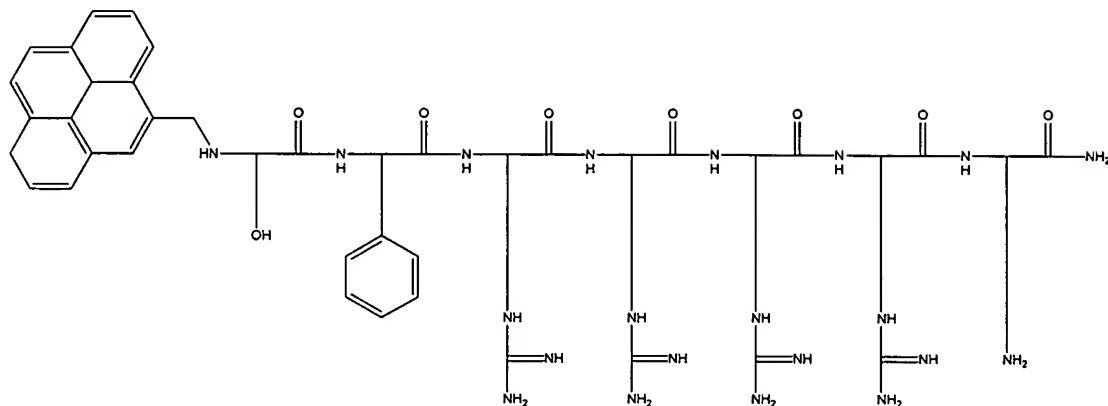
Compound 18



Compound 19



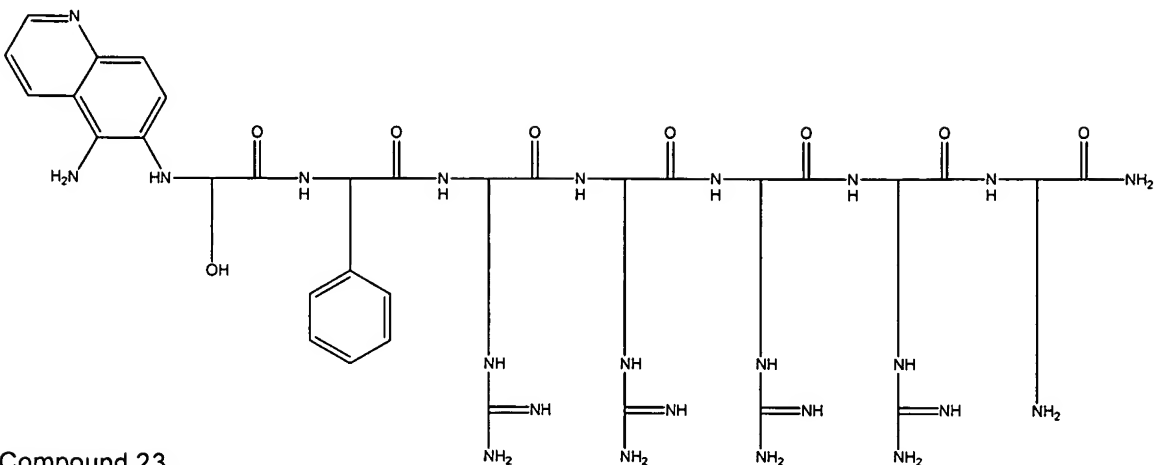
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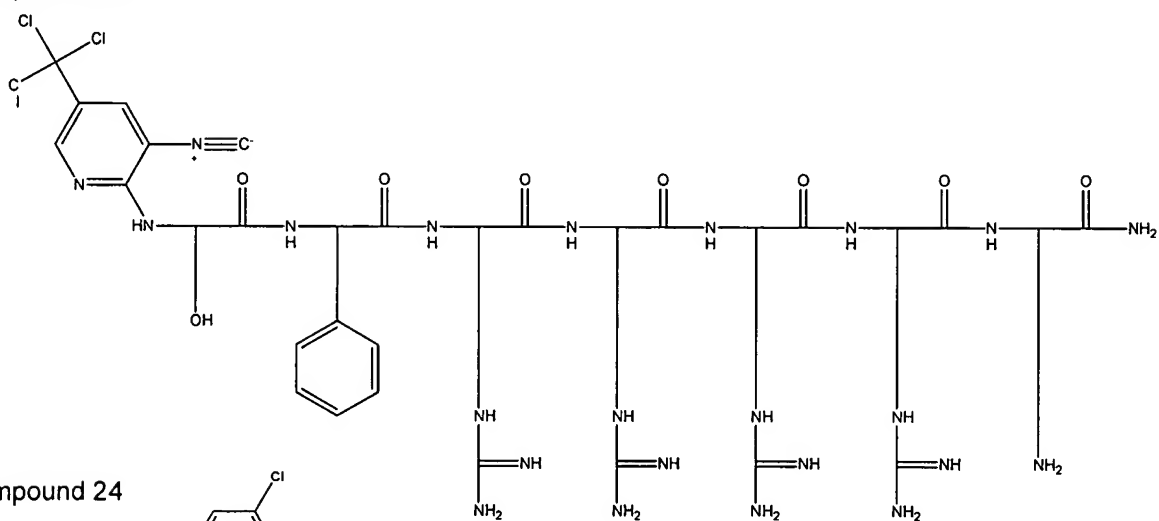
Compound 21

Chemical structure of Compound 22, a peptide derivative. The structure shows a backbone with seven amide bonds. The side chains are: a 2-phenyl-1H-benzimidazol-1-yl group, a hydroxyl group, a benzyl group, a guanidino group, a guanidino group, a guanidino group, a guanidino group, and an amino group. The guanidino groups are labeled with a subscript 2.

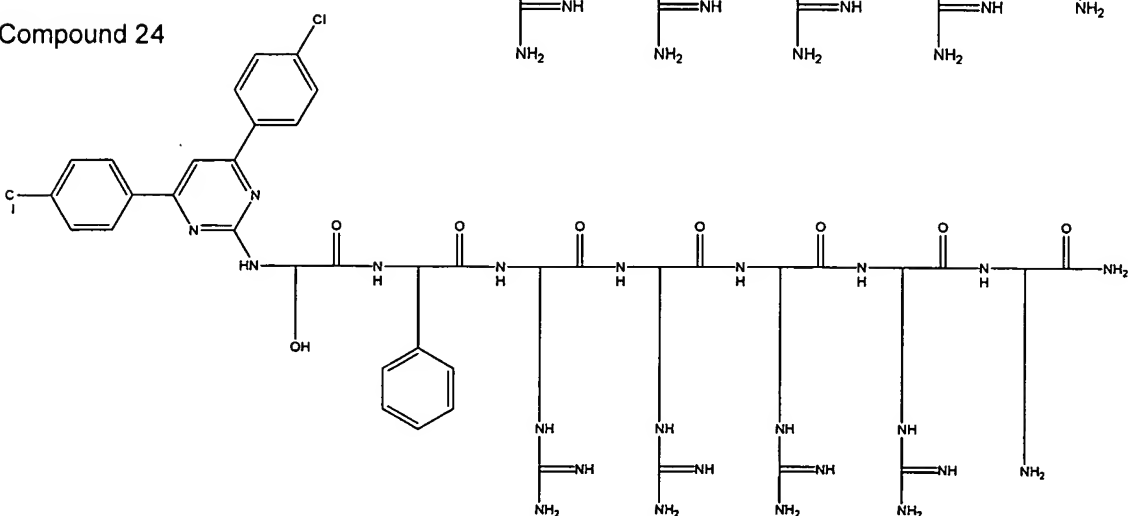
### Compound 22



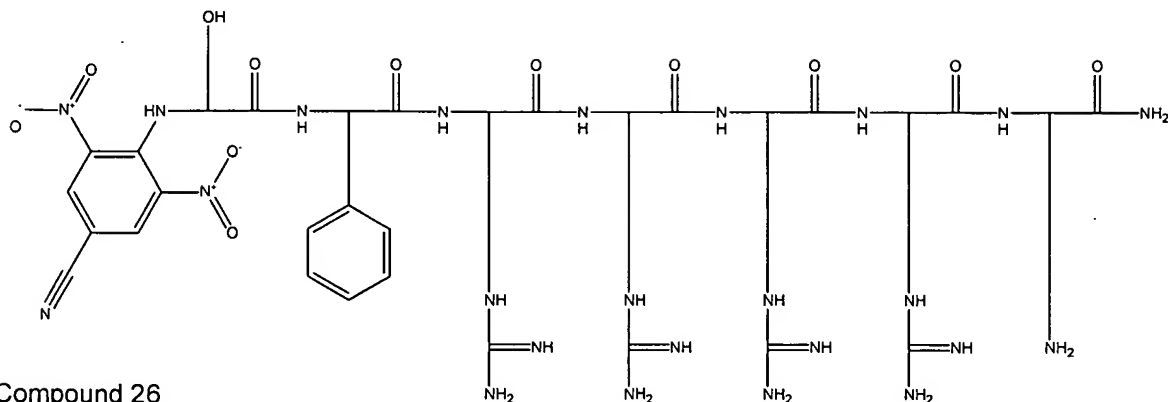
Compound 23



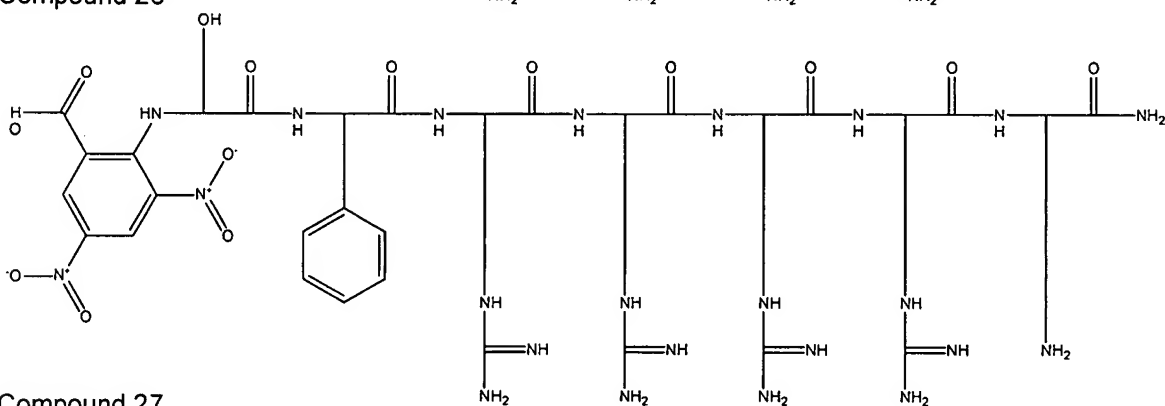
Compound 24



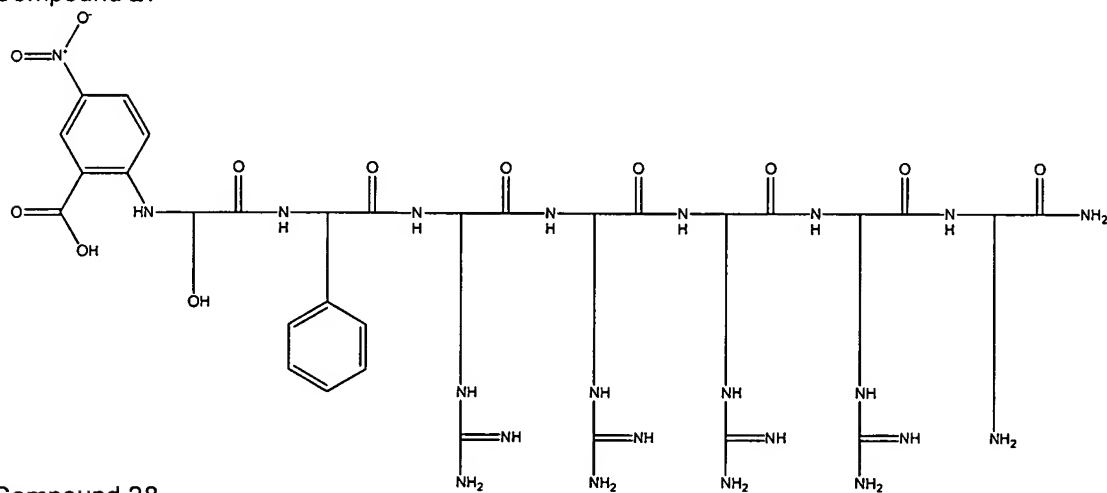
Compound 25



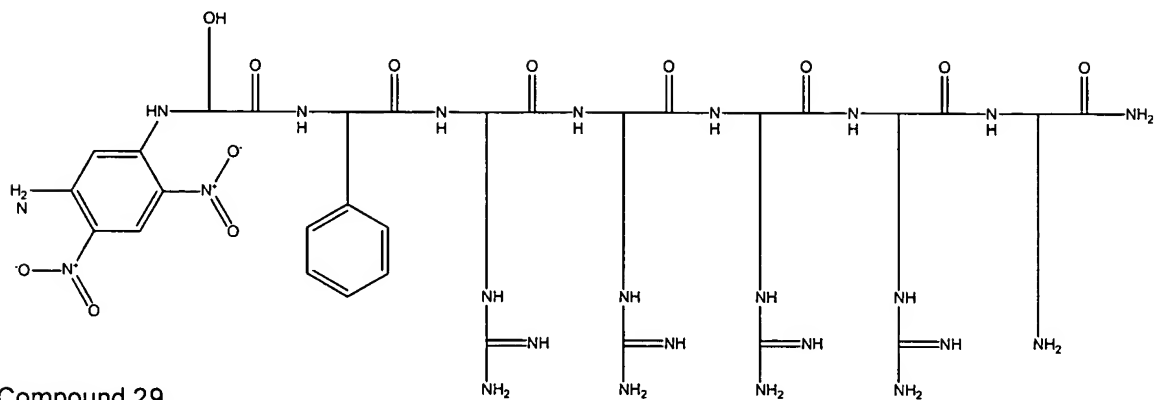
Compound 26



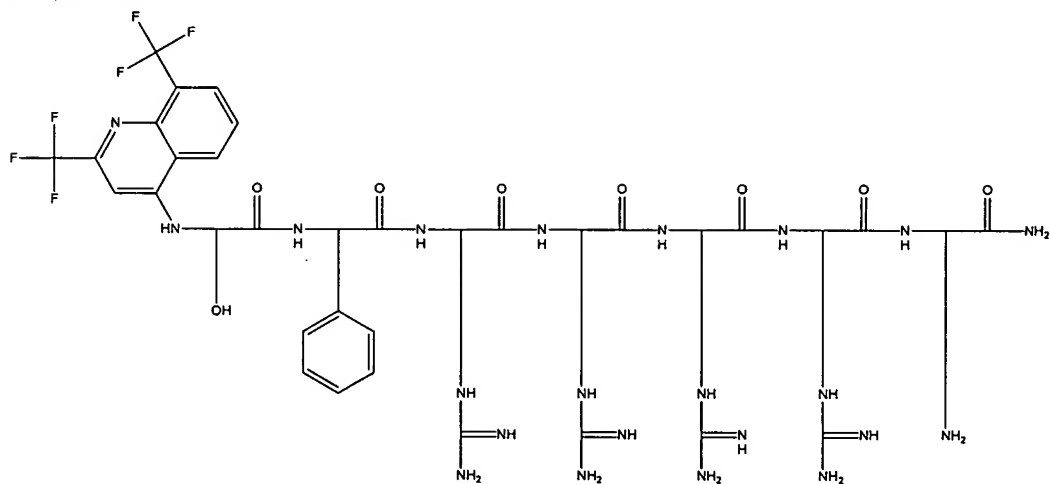
Compound 27



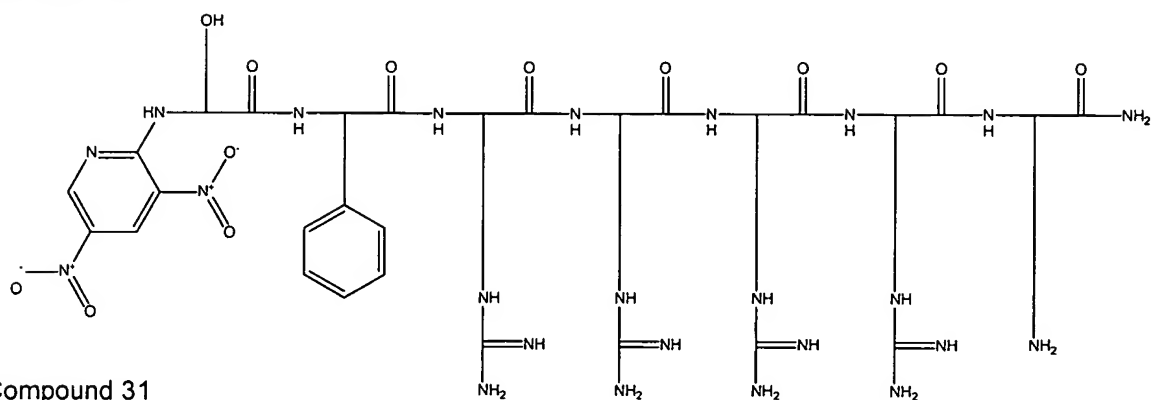
Compound 28



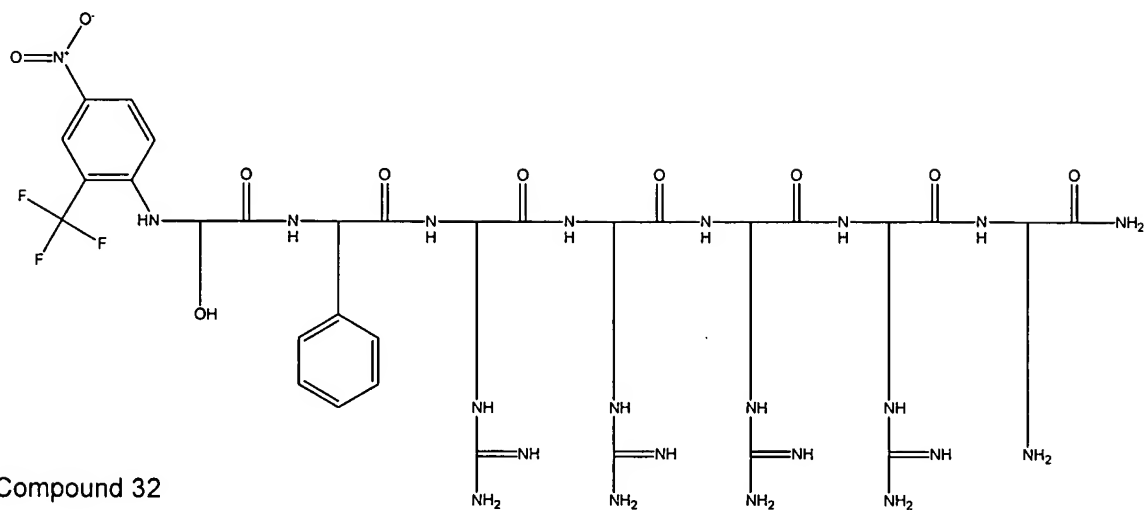
Compound 29



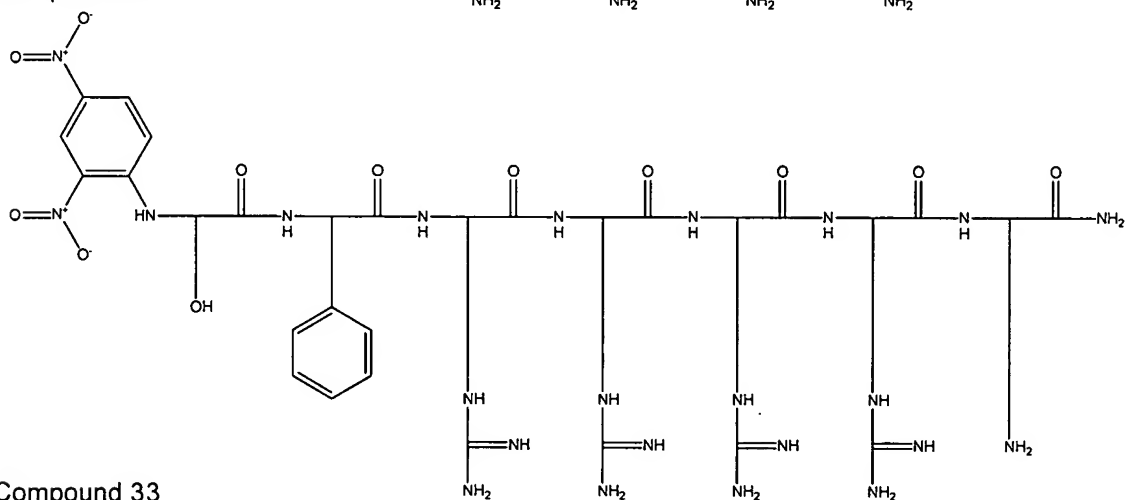
Compound 30



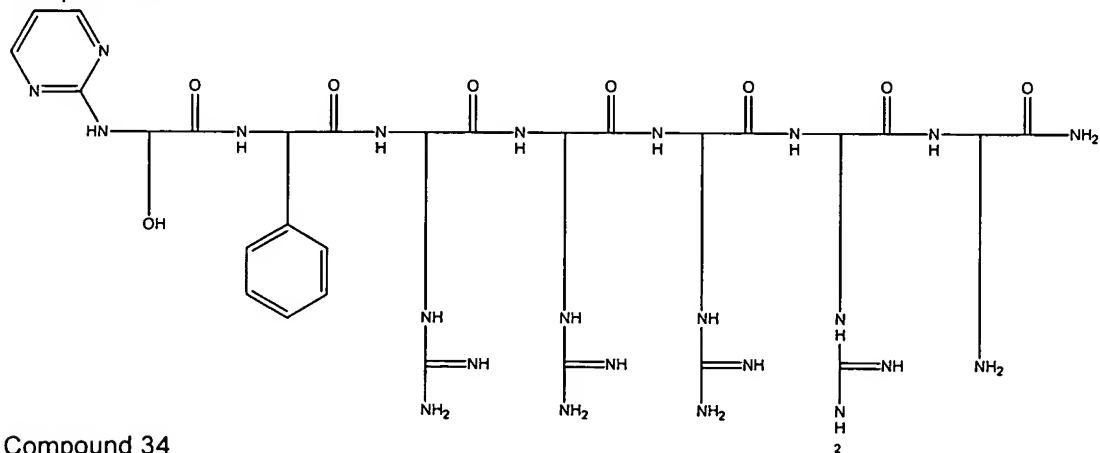
Compound 31



Compound 32

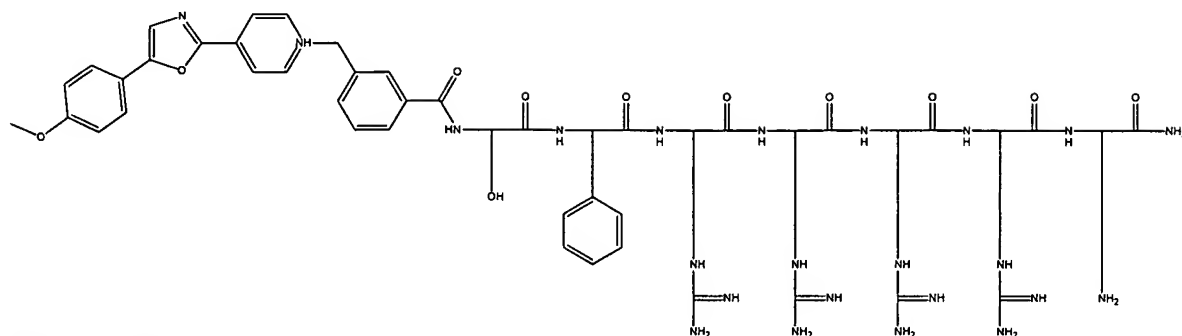


Compound 33

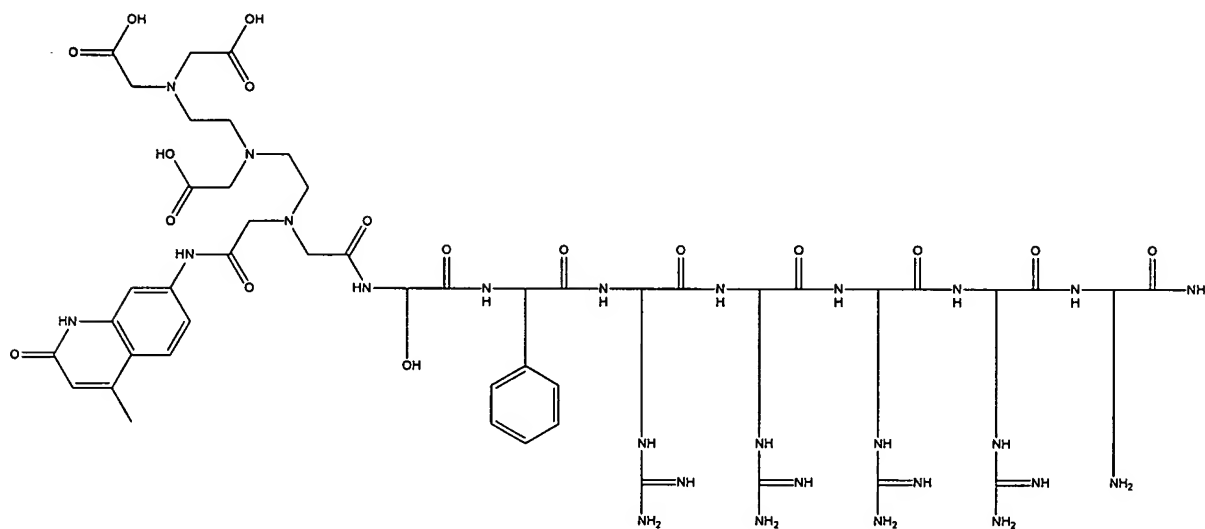


Compound 34

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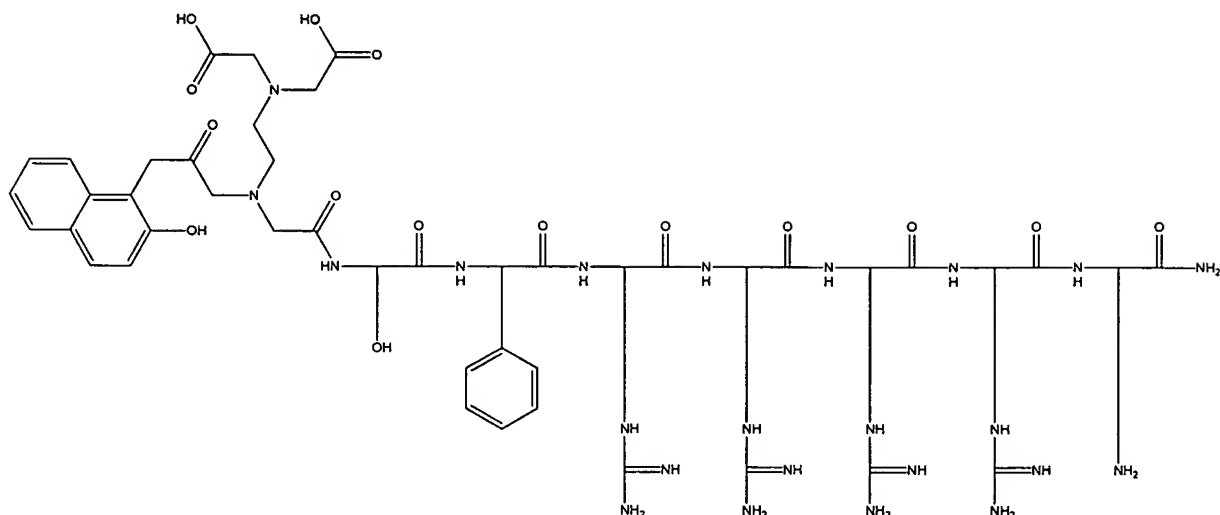


Compound 35

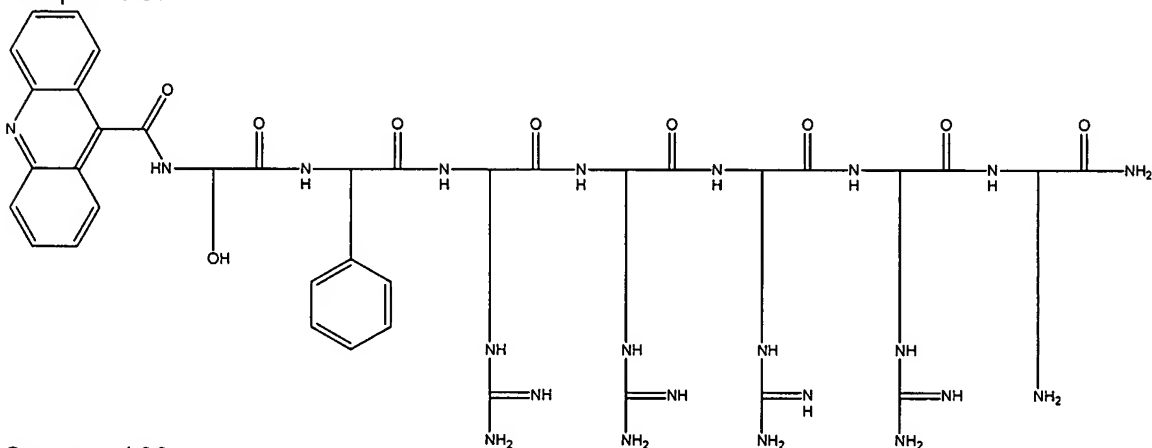


Compound 36

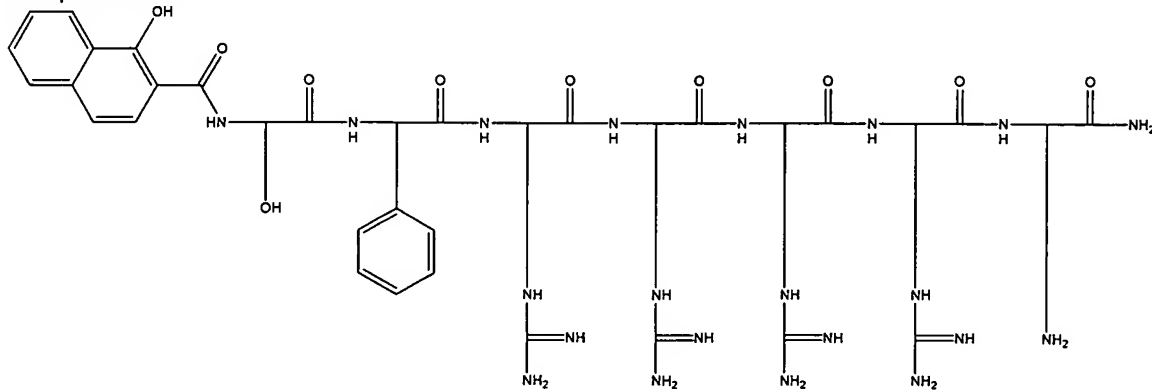
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Compound 37

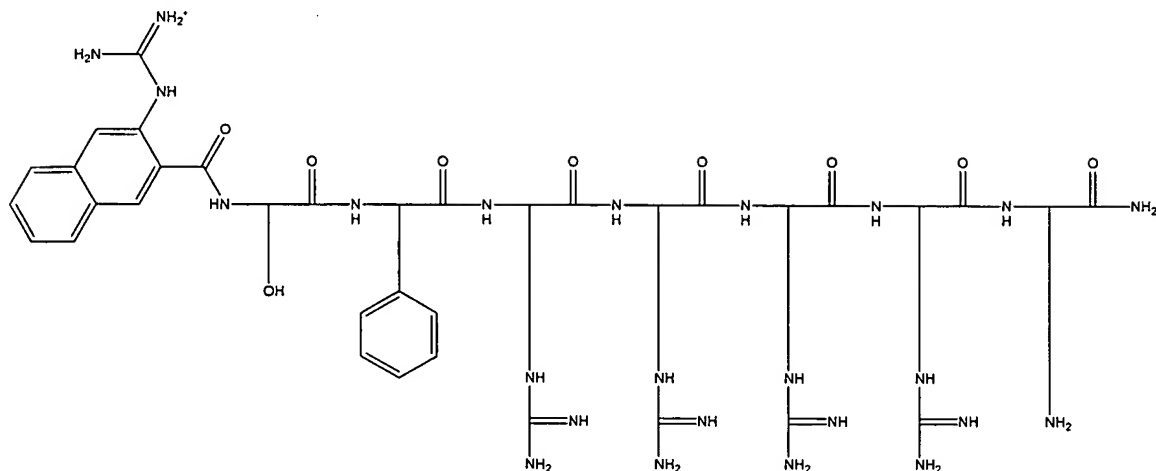


Compound 38

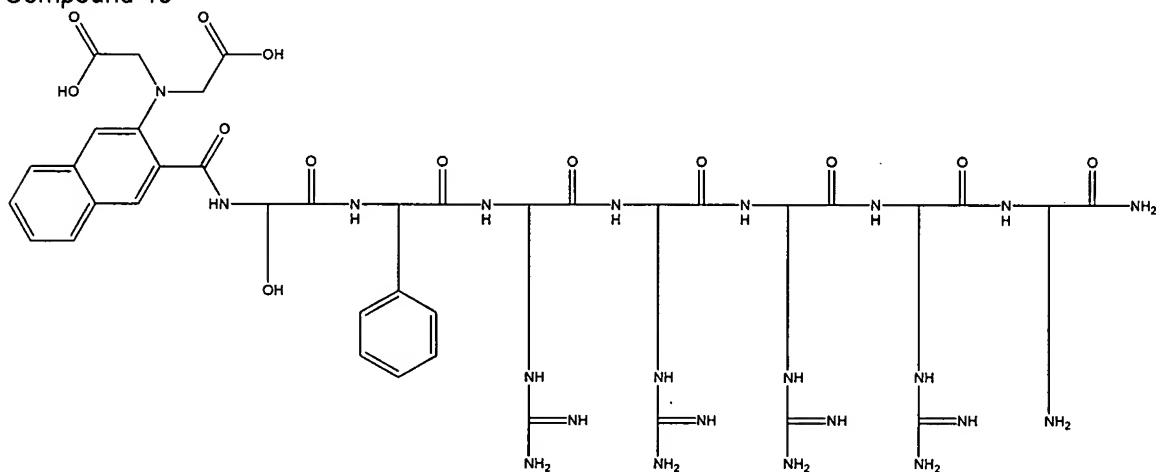


Compound 39

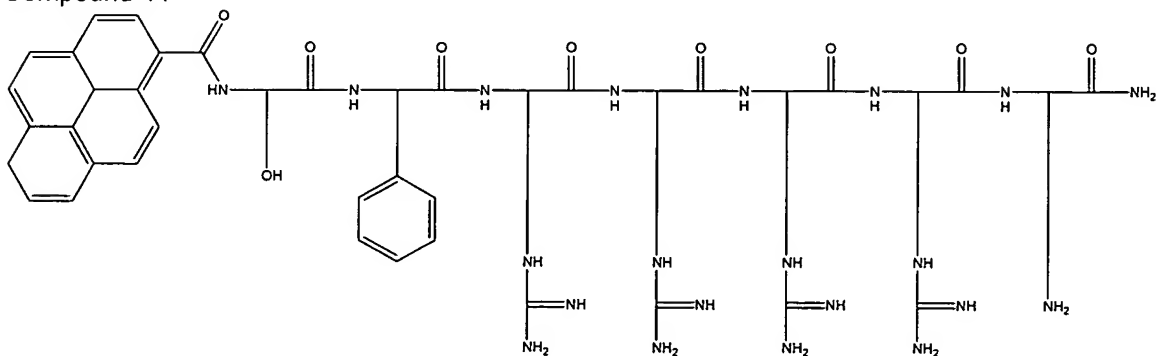
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Compound 40



Compound 41



Compound 42

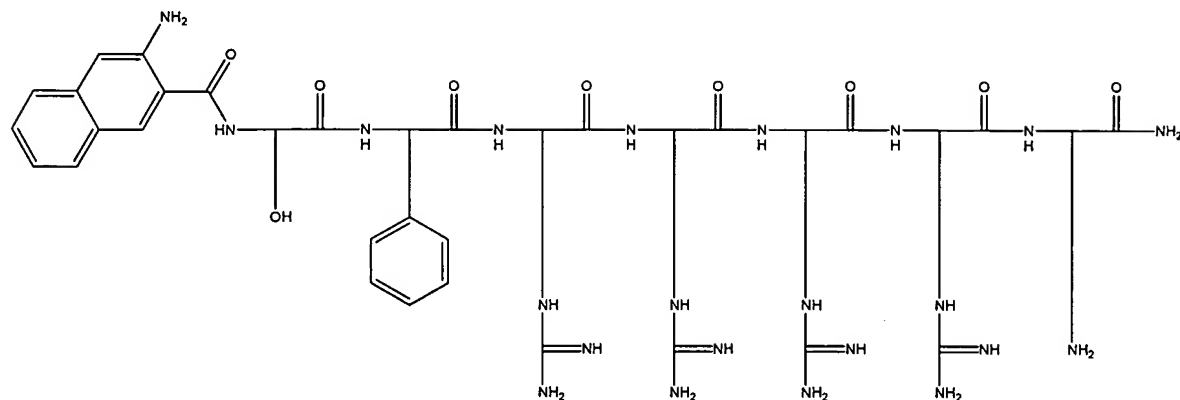


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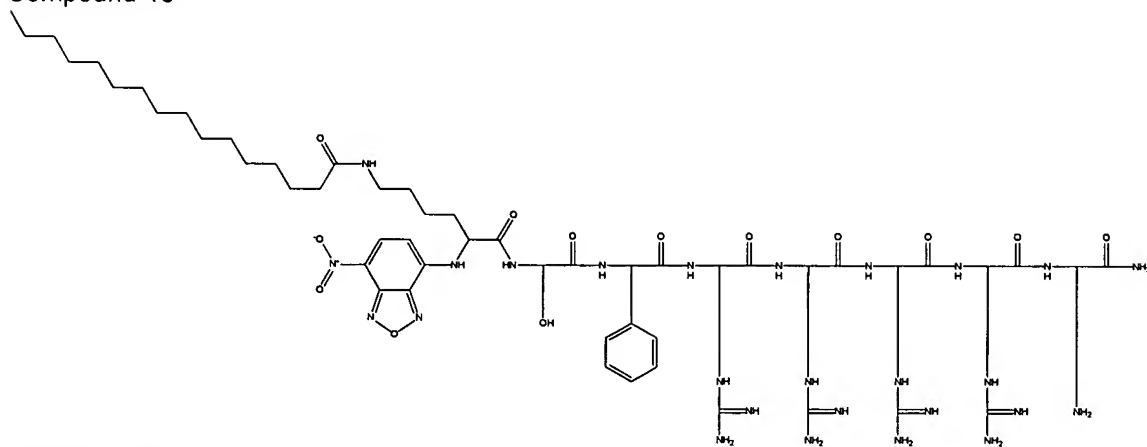
Serial No.: 10/755,086

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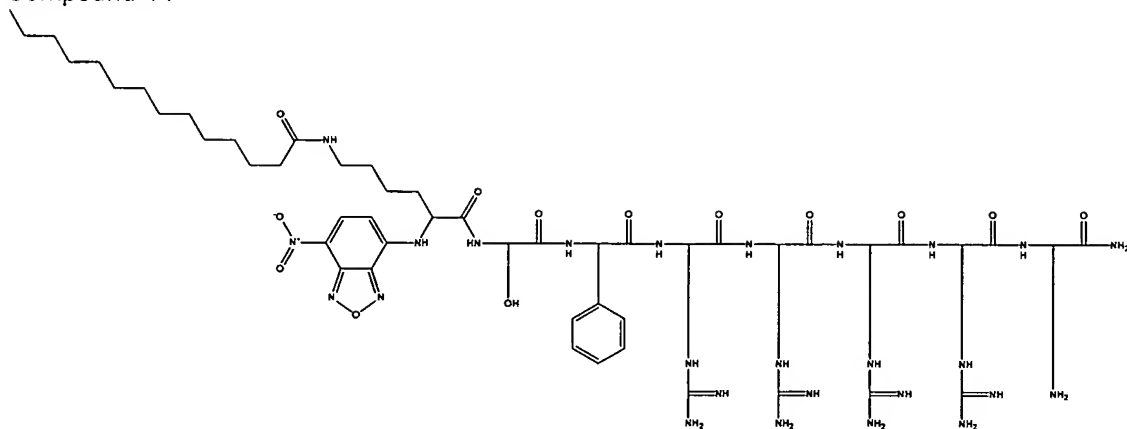
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Compound 43

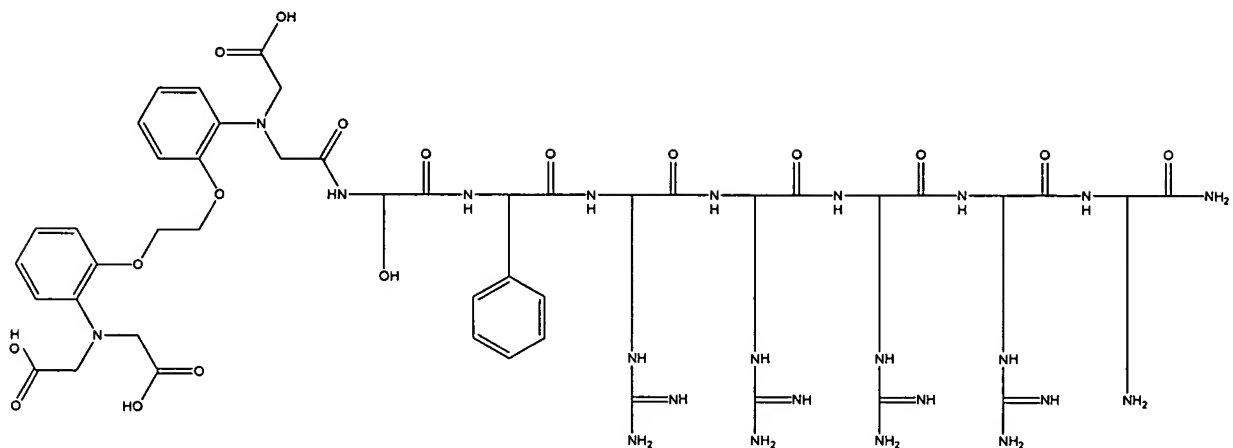


Compound 44



Compound 45

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[illegible][illegible]

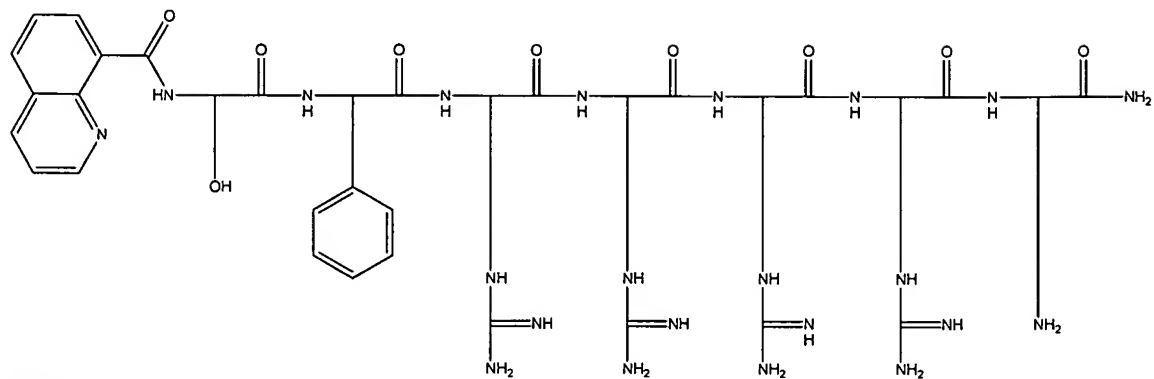
Compound 48

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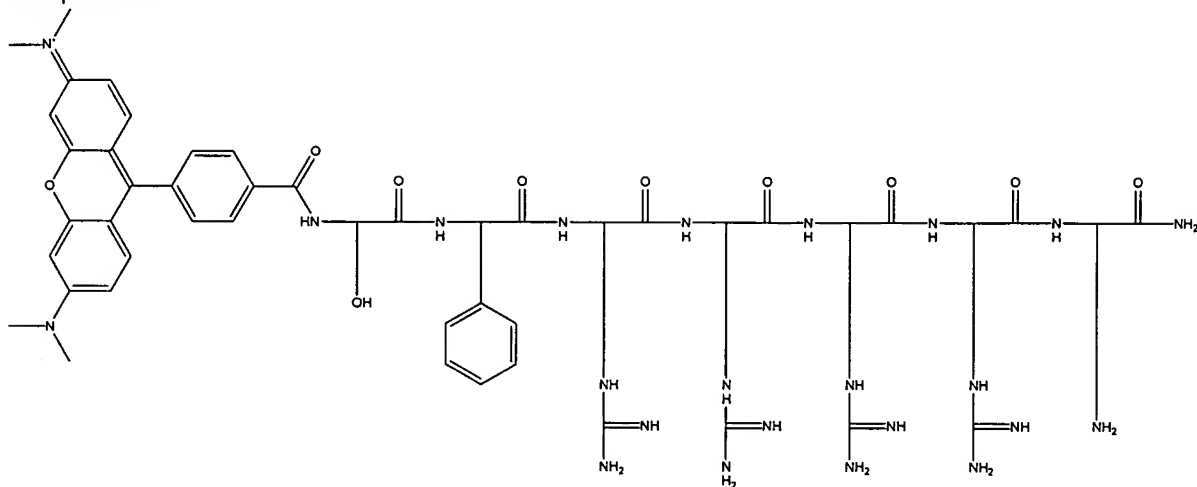
Serial No.: 10/755,086

Filed: January 9, 2004

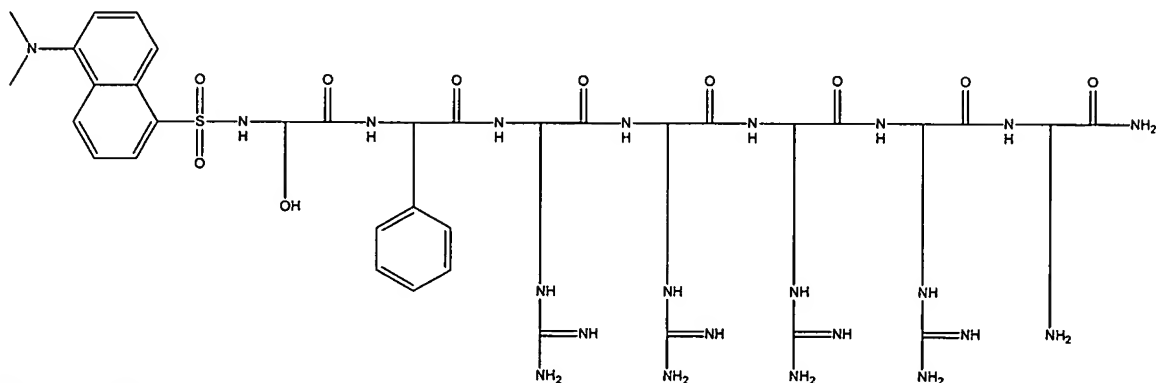
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Compound 49

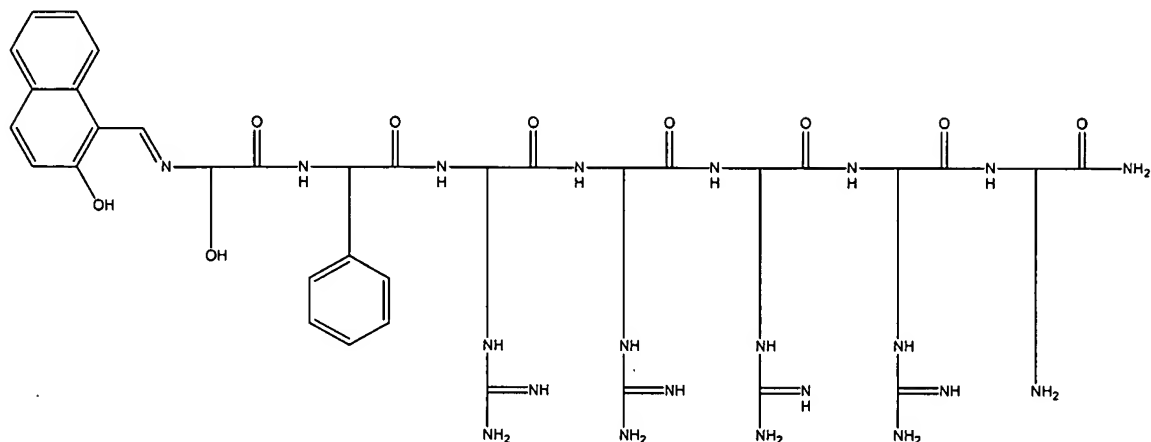


Compound 50

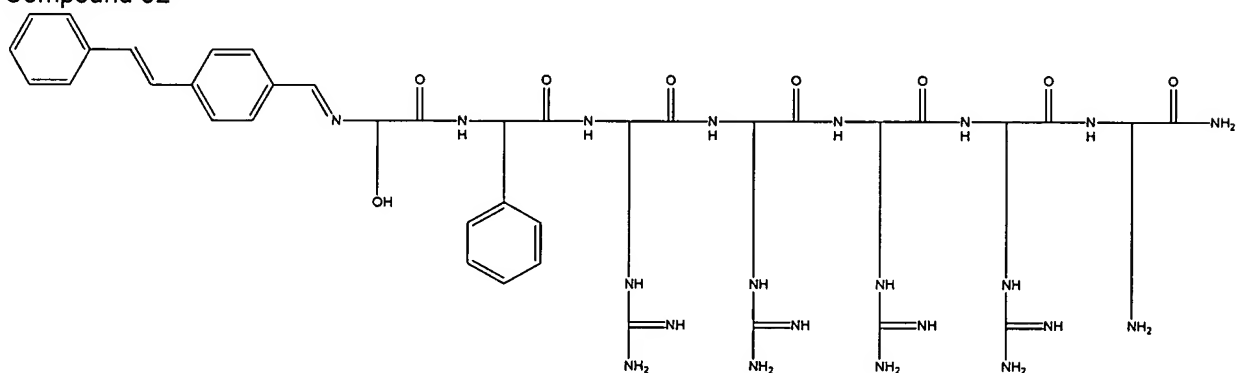


Compound 51

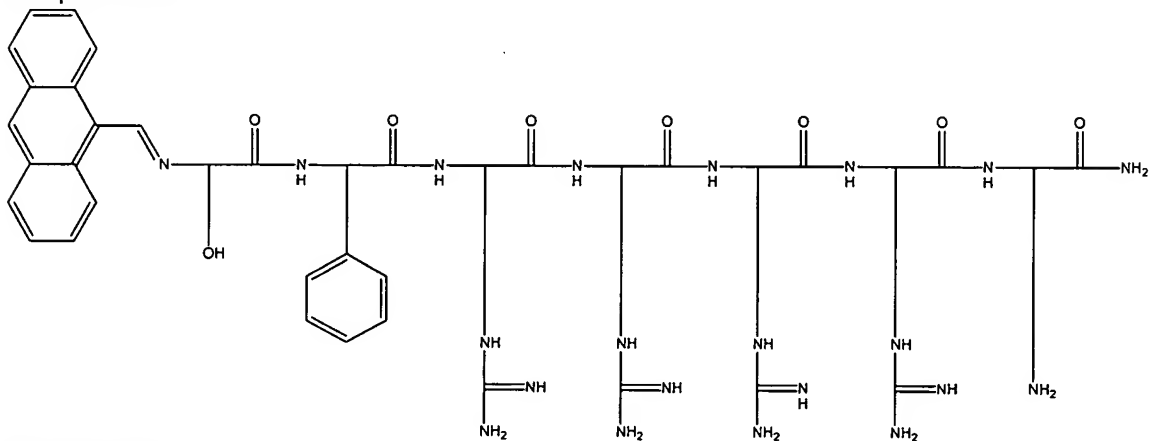
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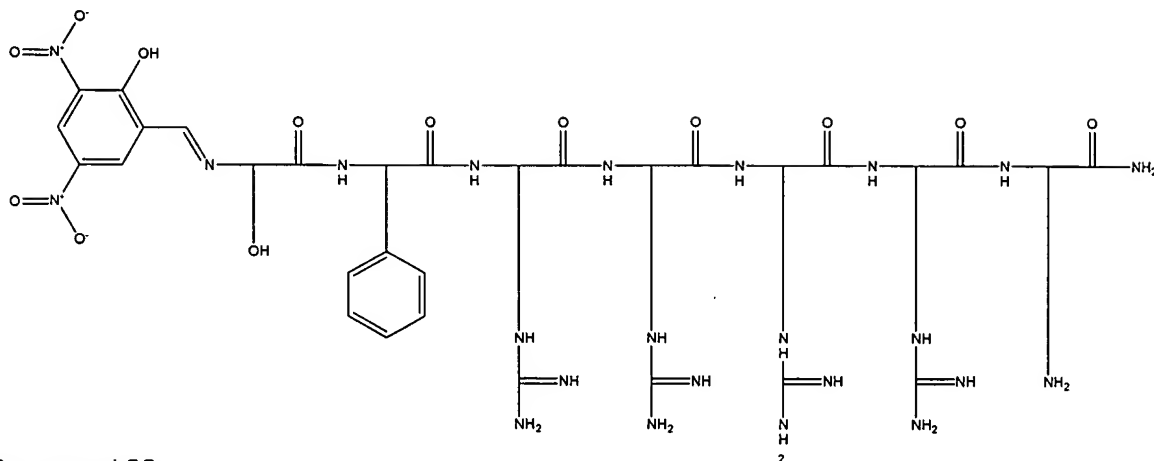
Compound 52



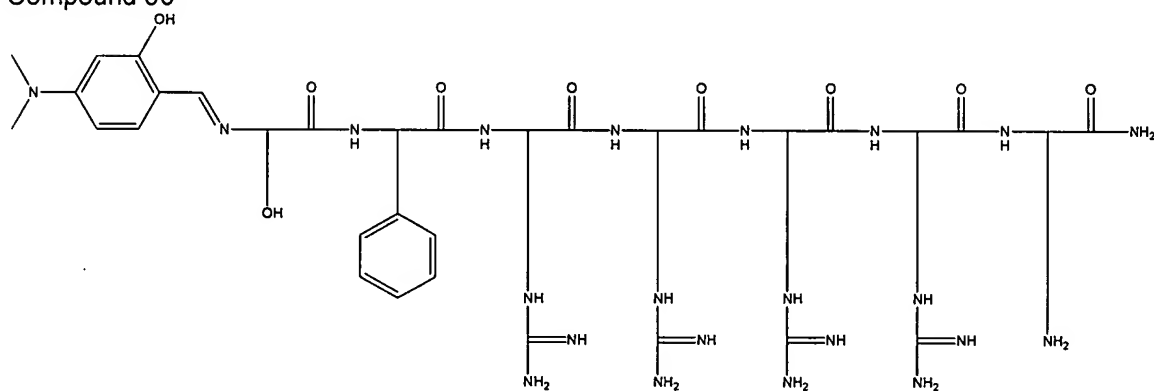
Compound 53



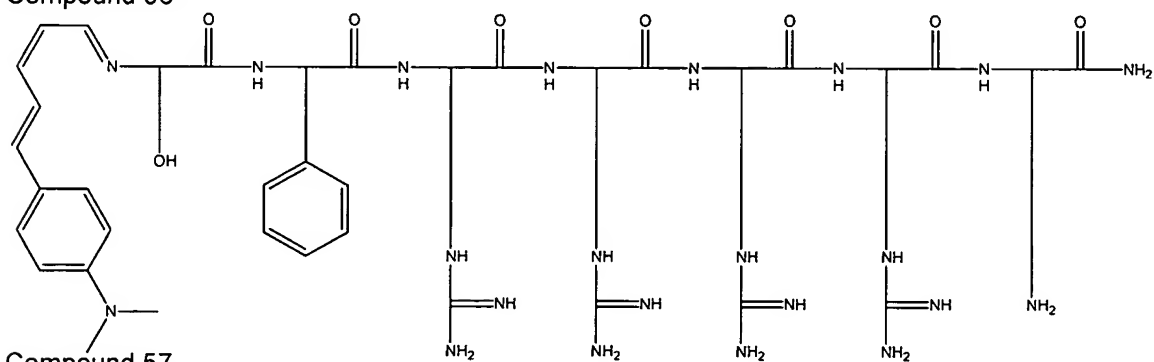
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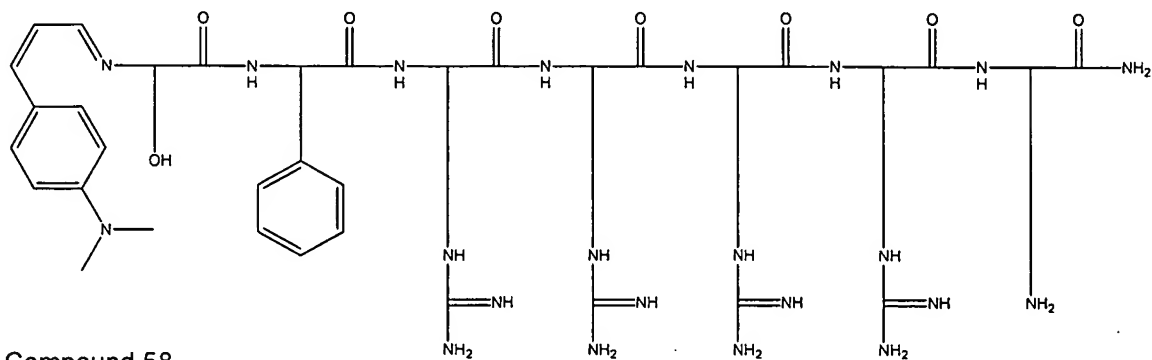
Compound 55



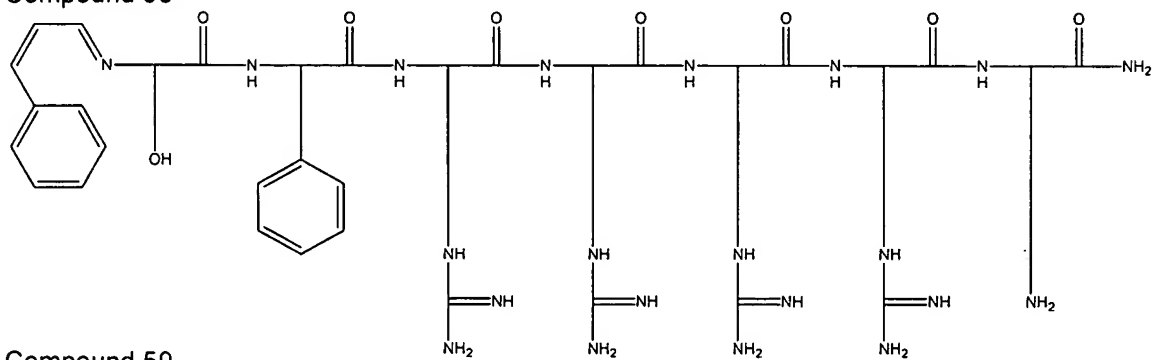
Compound 56



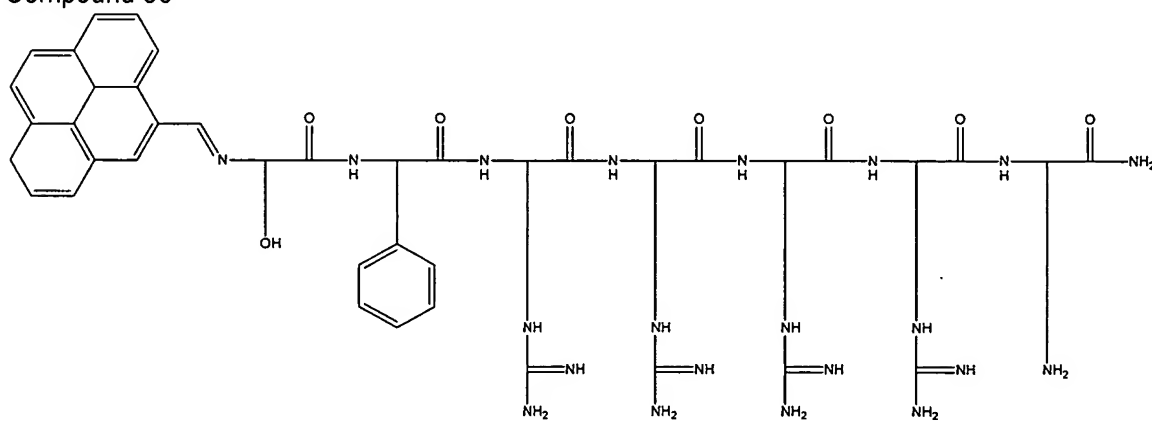
Compound 57



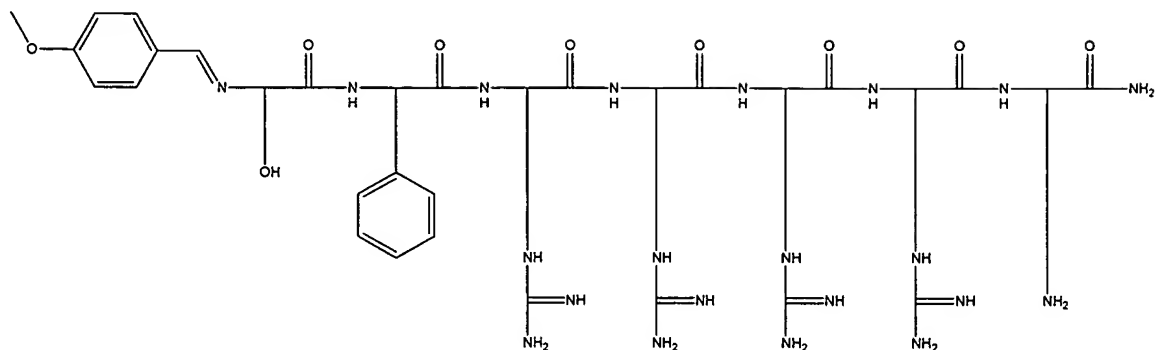
Compound 58



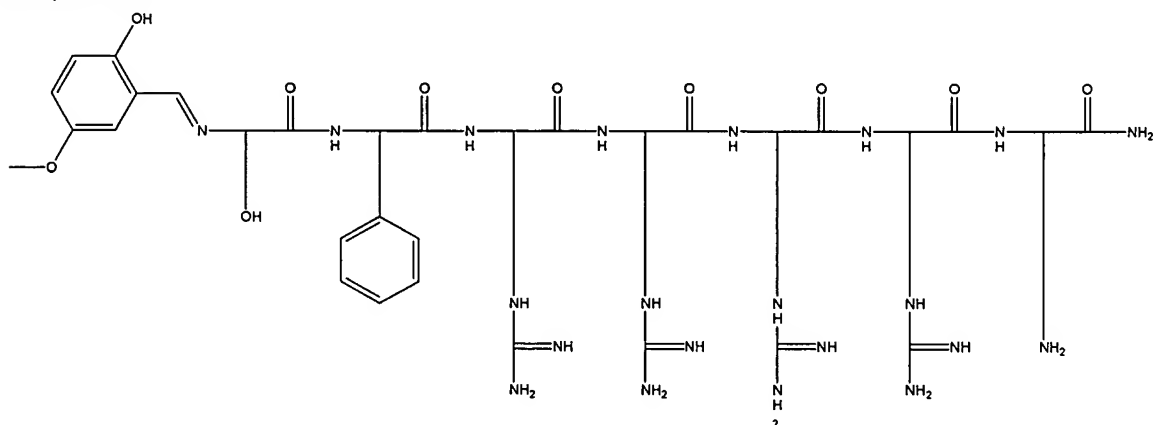
Compound 59



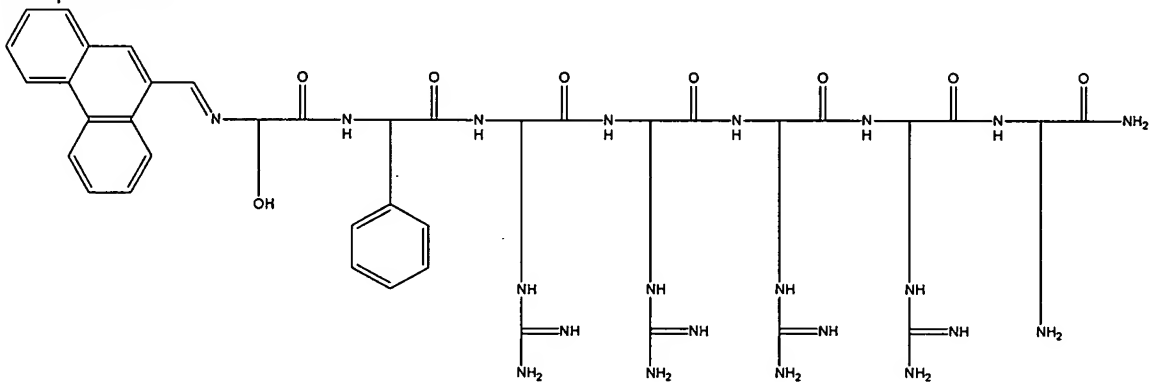
Compound 60



Compound 61

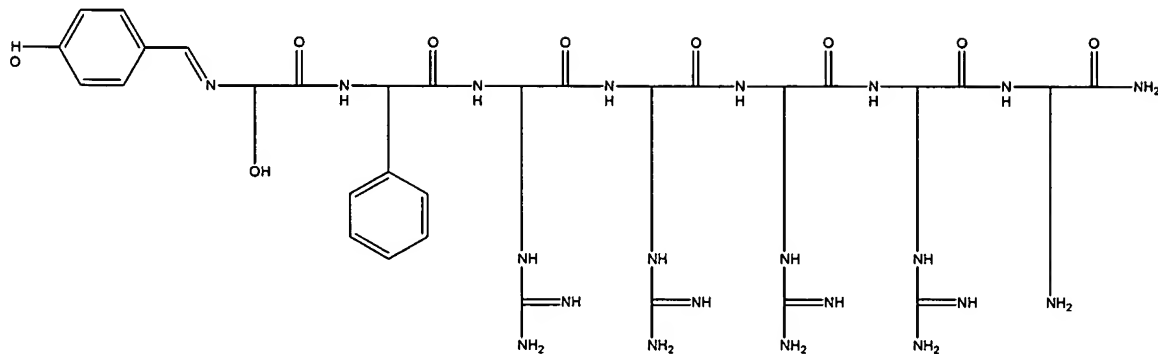


Compound 62

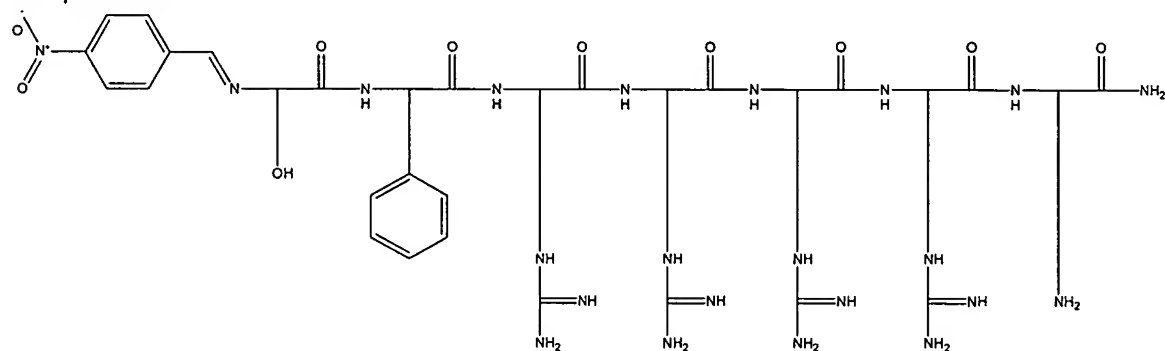


Compound 63

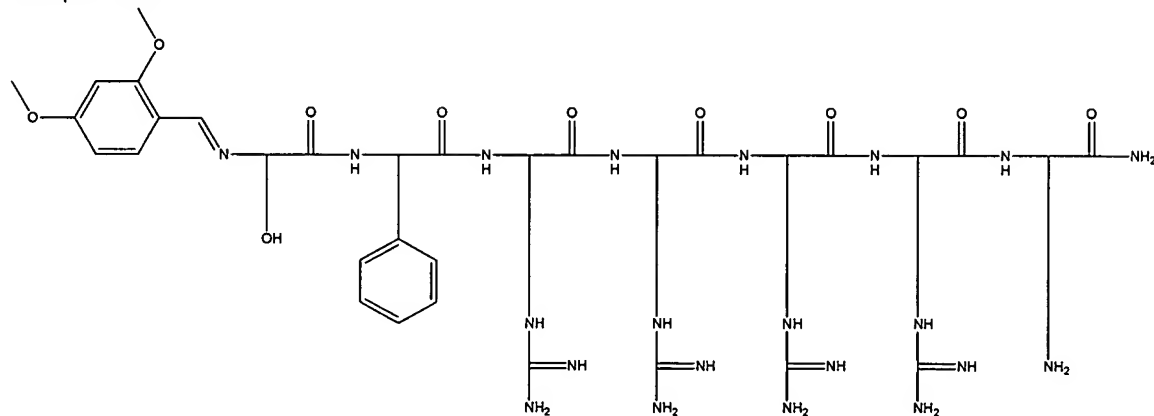
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Compound 64

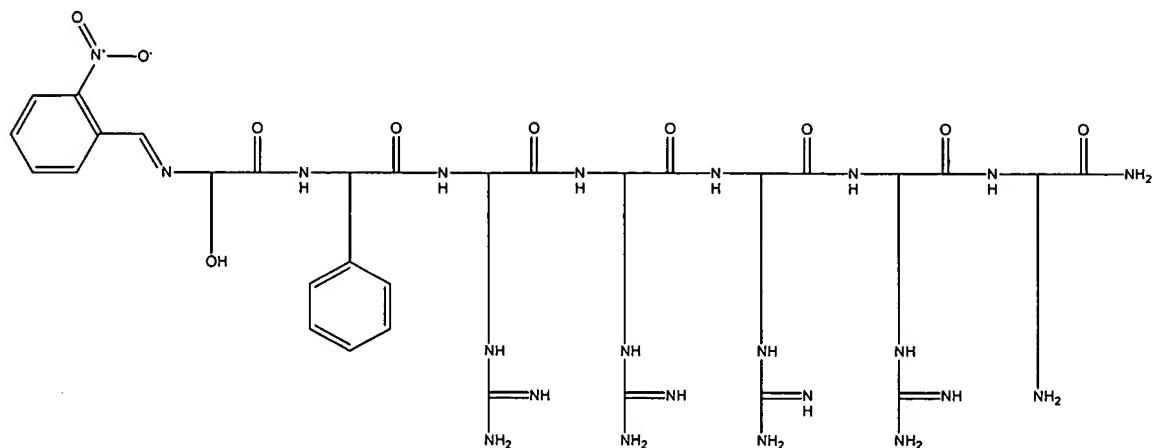


Compound 65

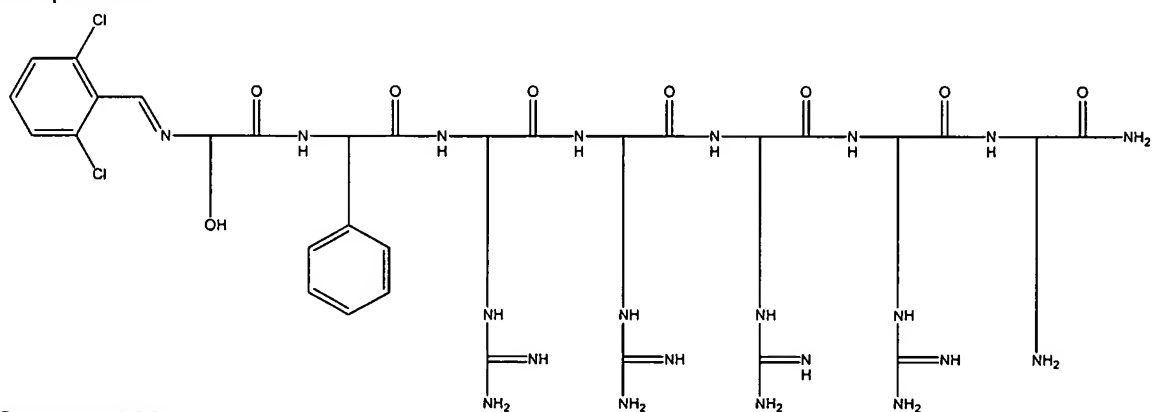


Compound 66

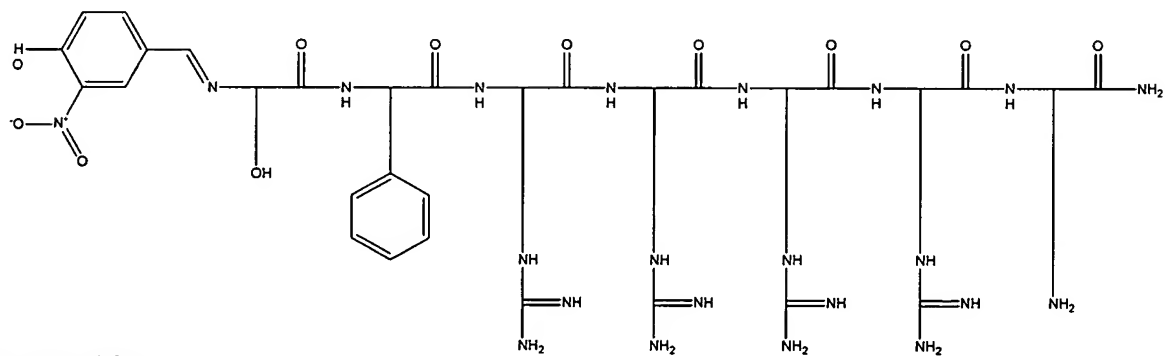




Compound 67

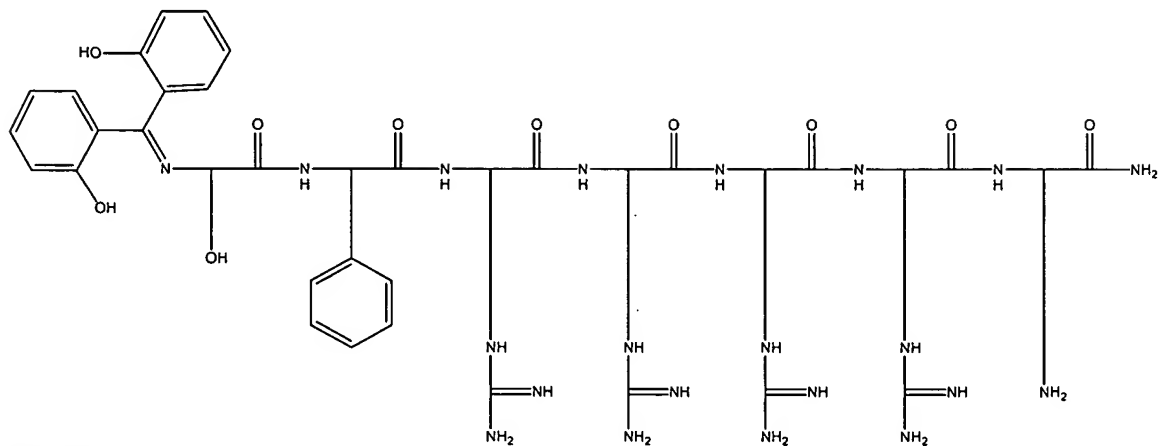


Compound 68

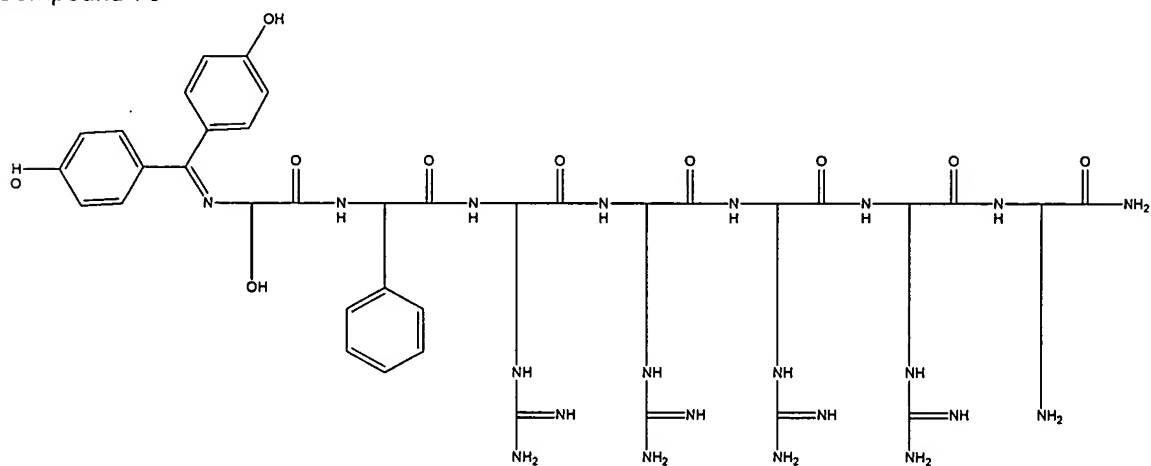


Compound 69

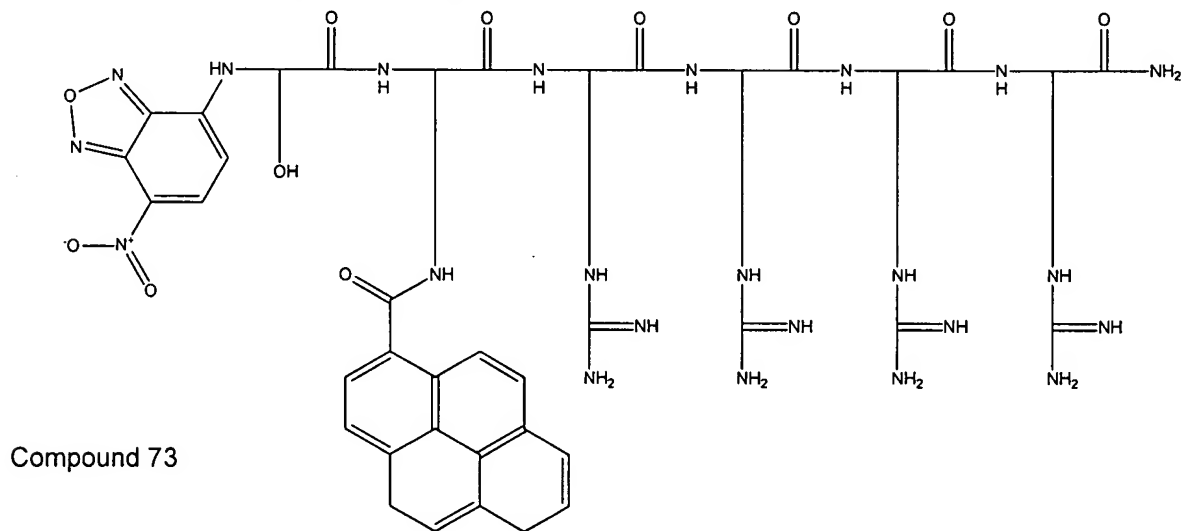
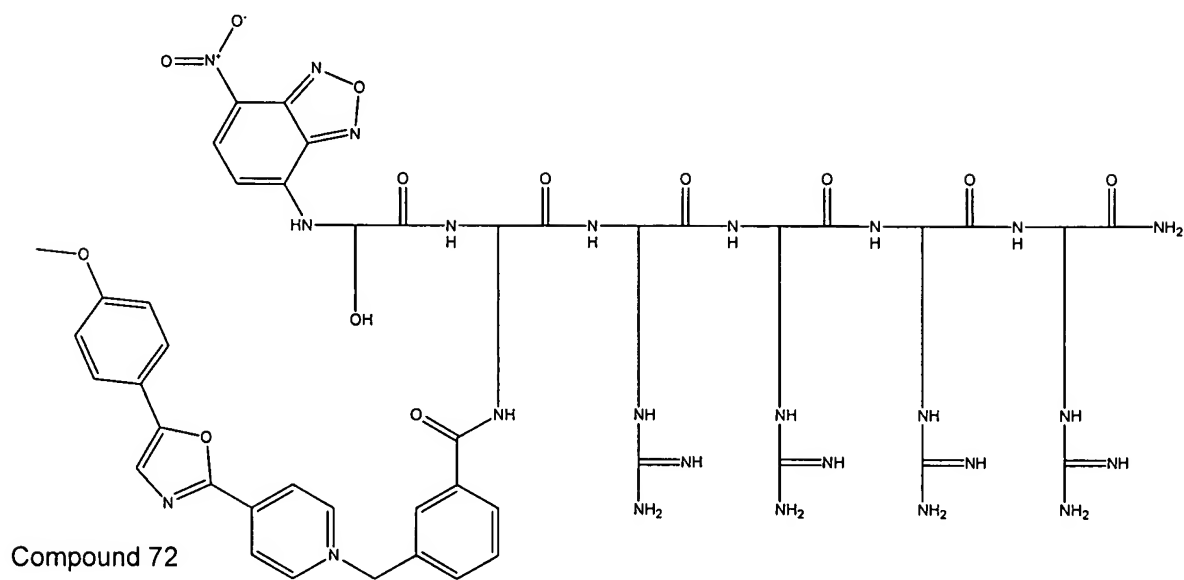
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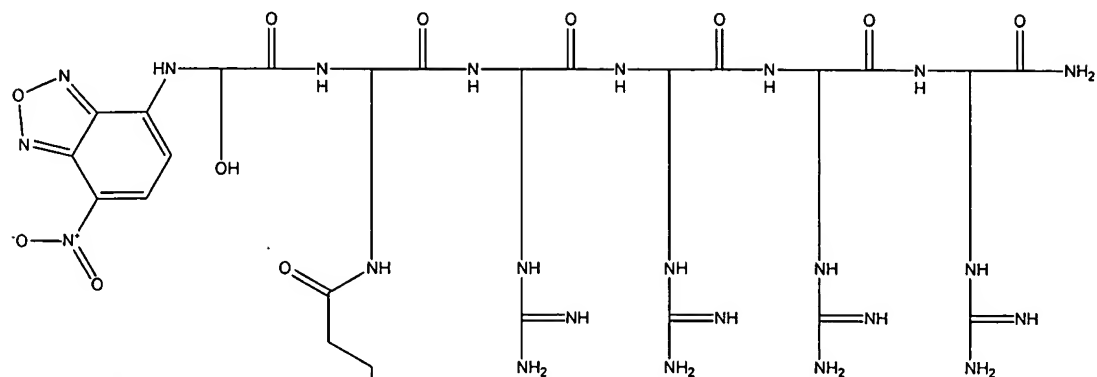


Compound 70

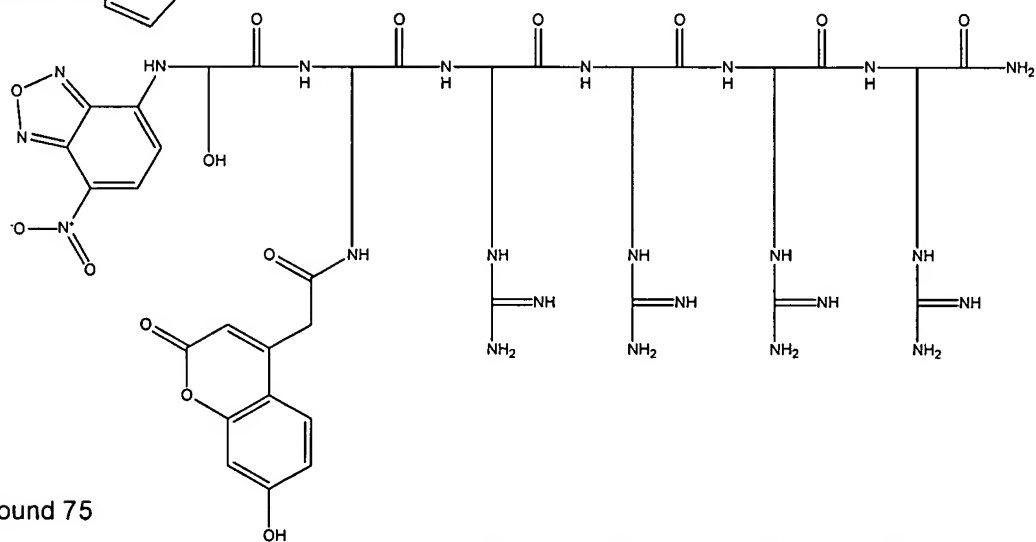


Compound 71



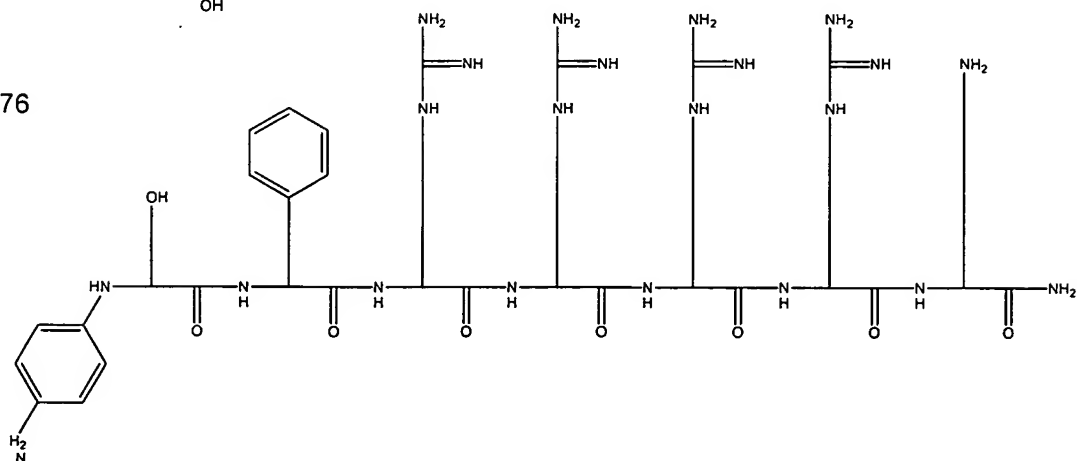


Compound 74

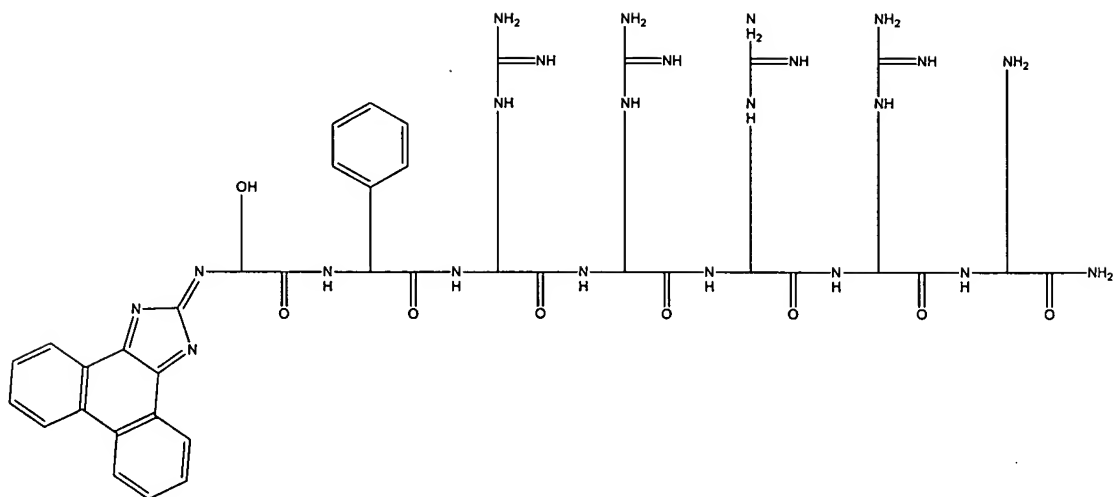


Compound 75

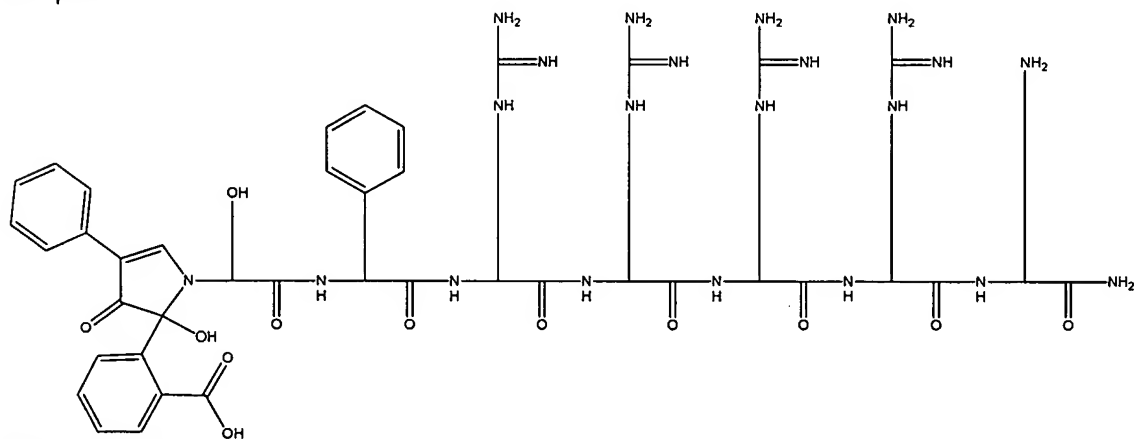
Compound 76



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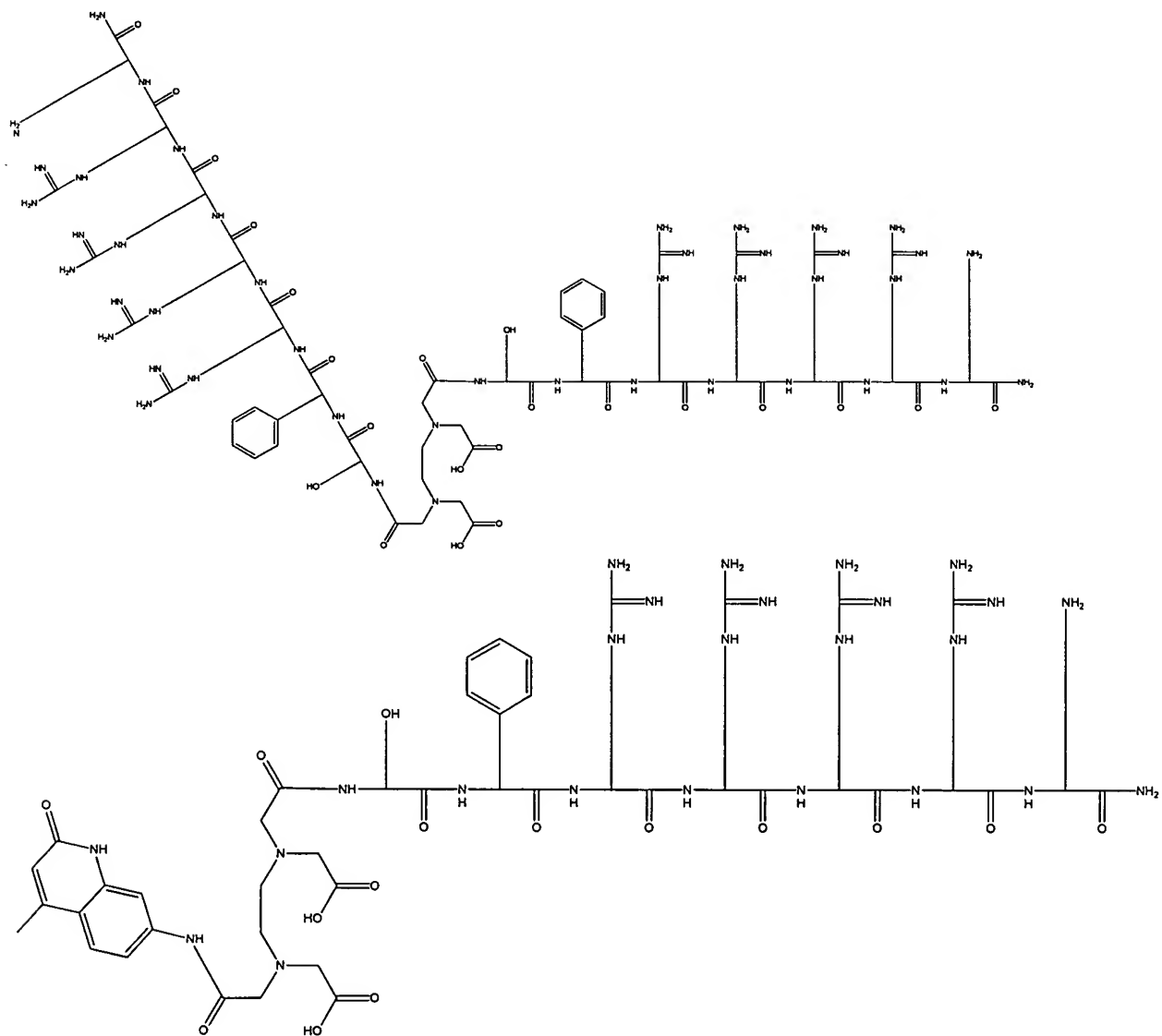
Compound 77



Compound 78

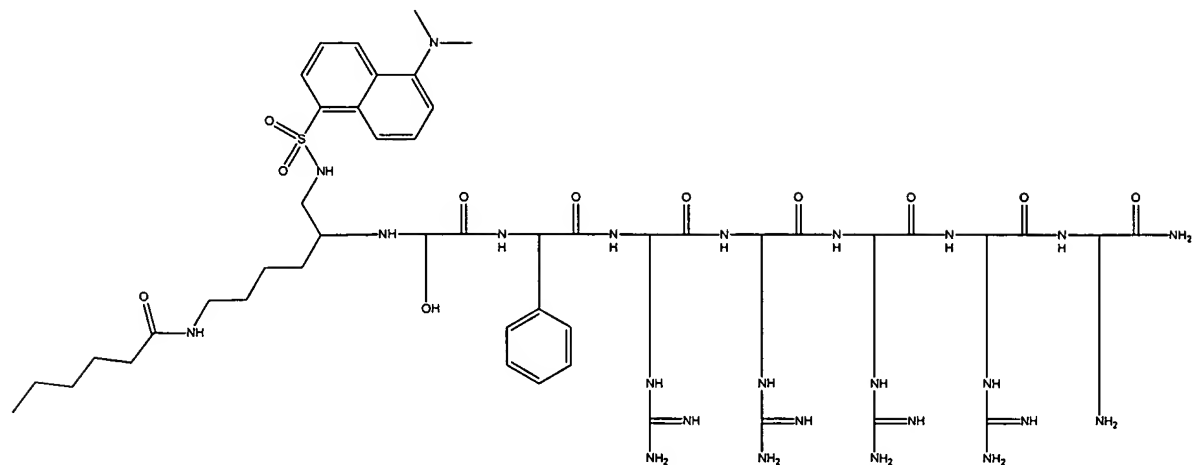
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Compound 79



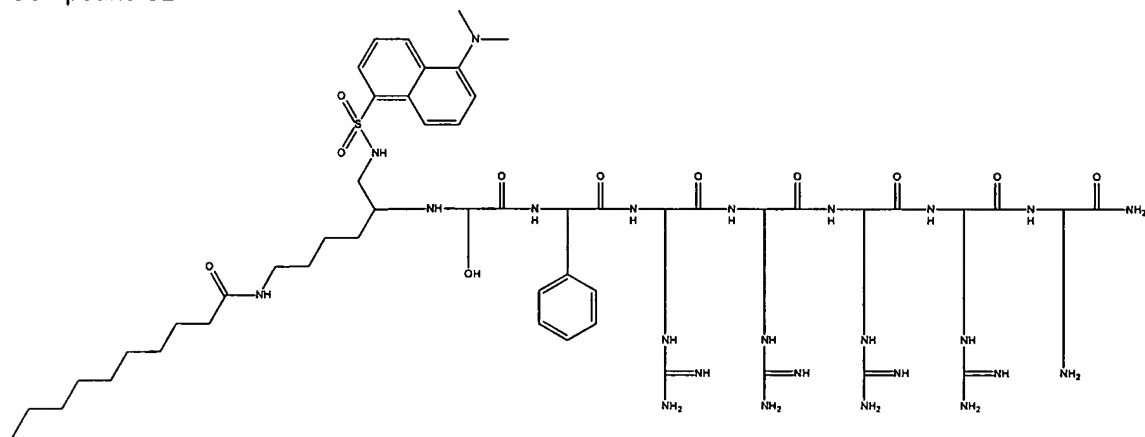
Compound 80

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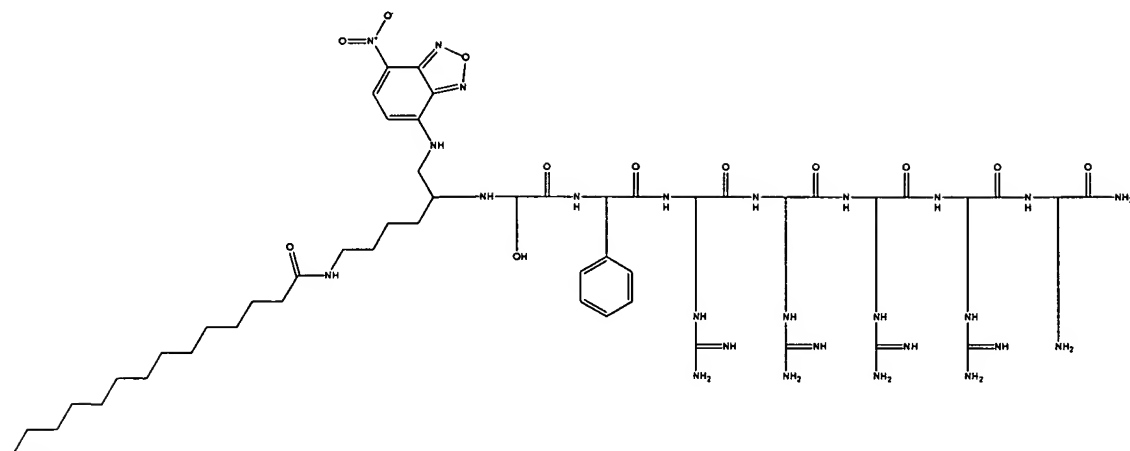


Compound 81

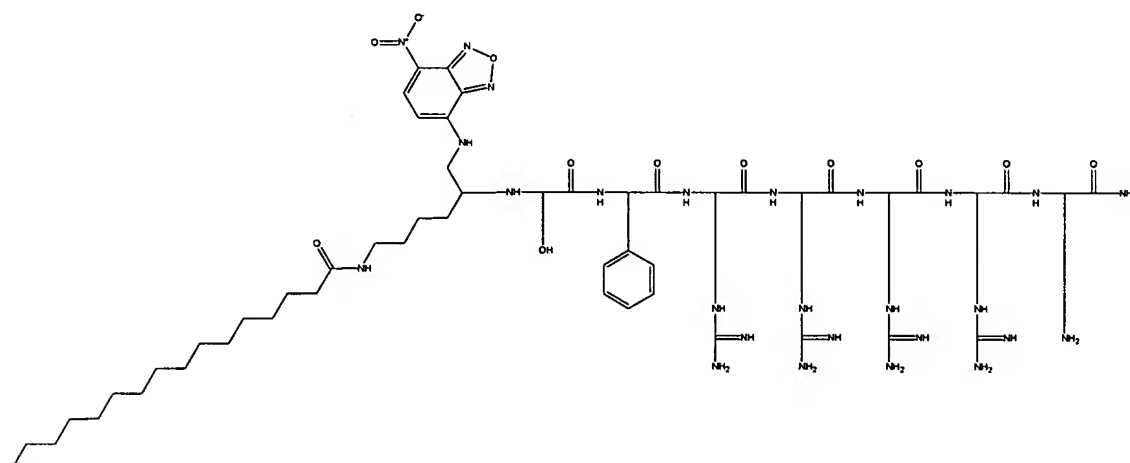
Compound 82



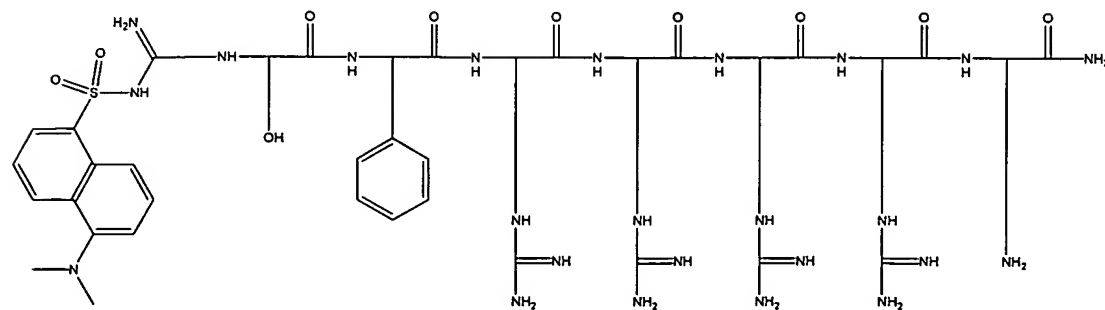
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Compound 83



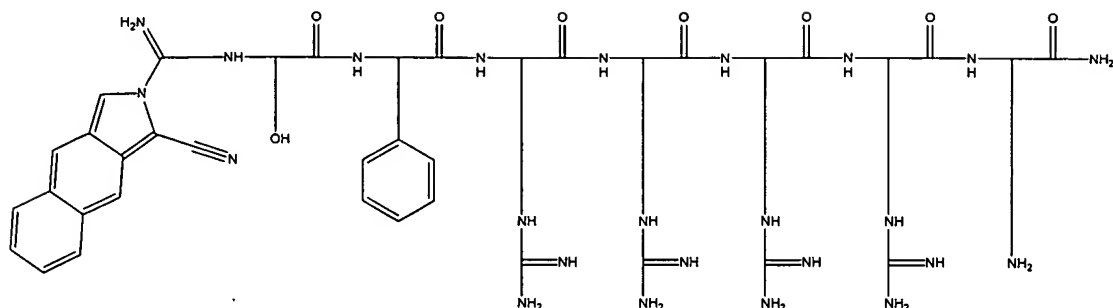
Compound 84



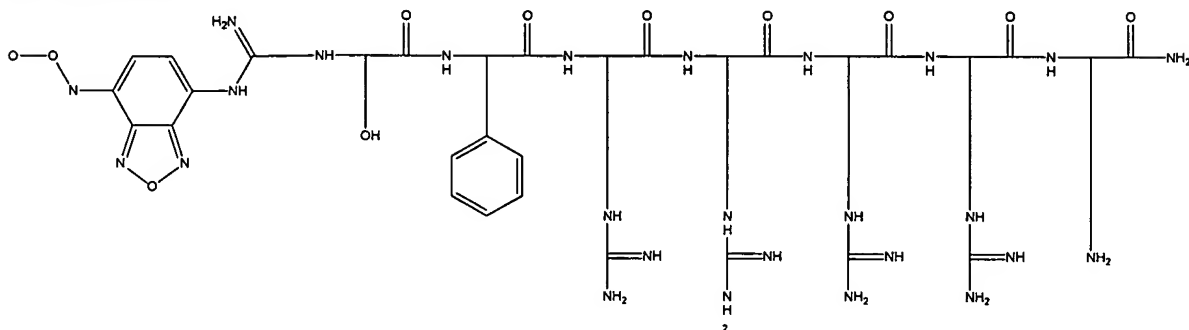
Compound 85



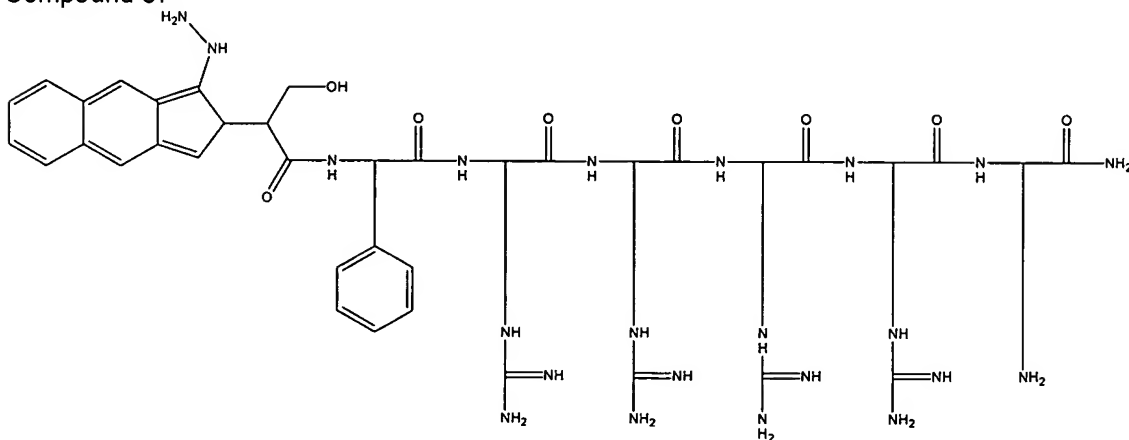
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Compound 86

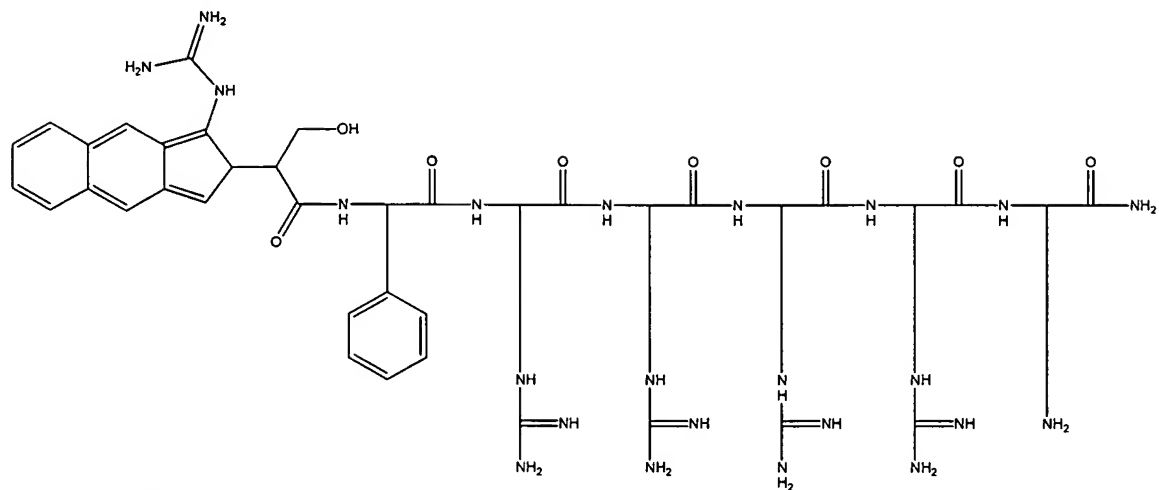


Compound 87

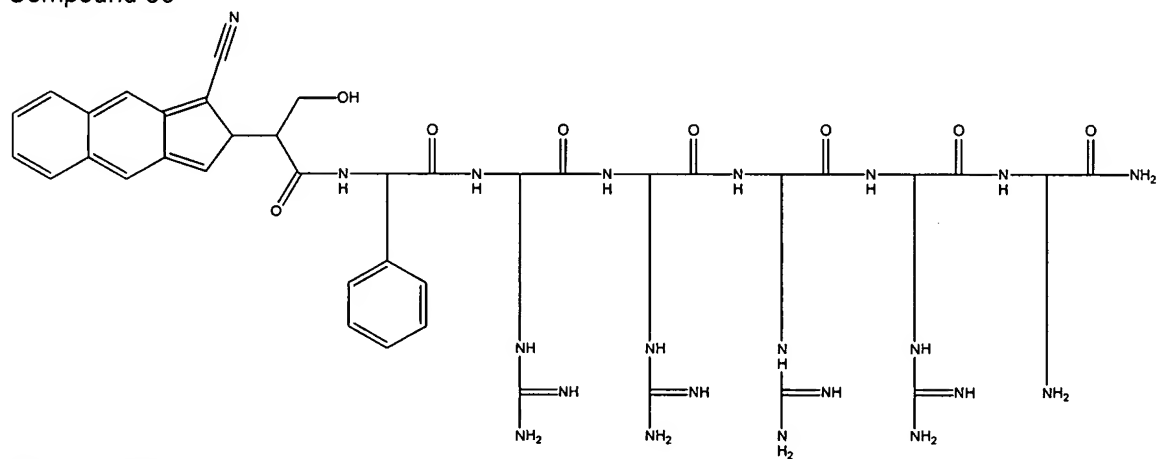


Compound 88

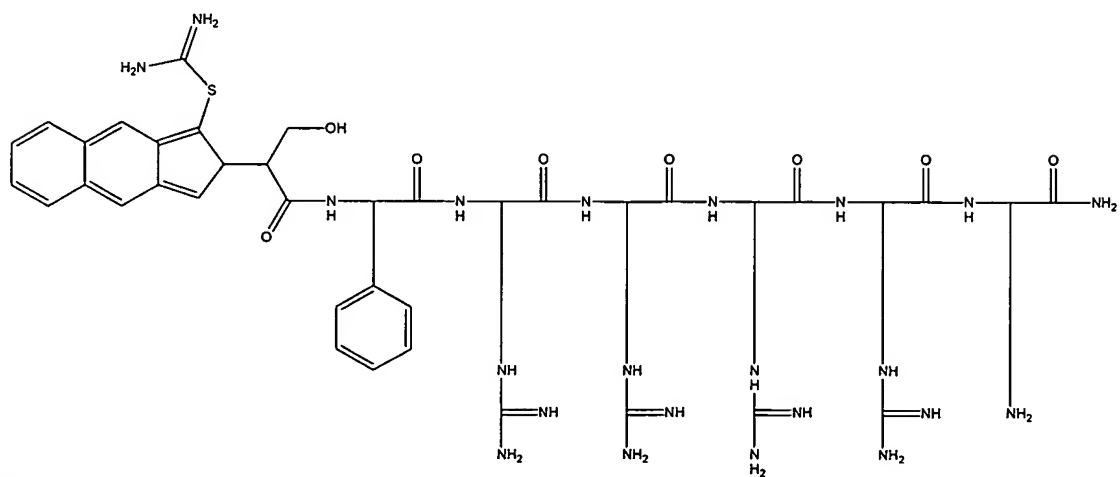
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Compound 89

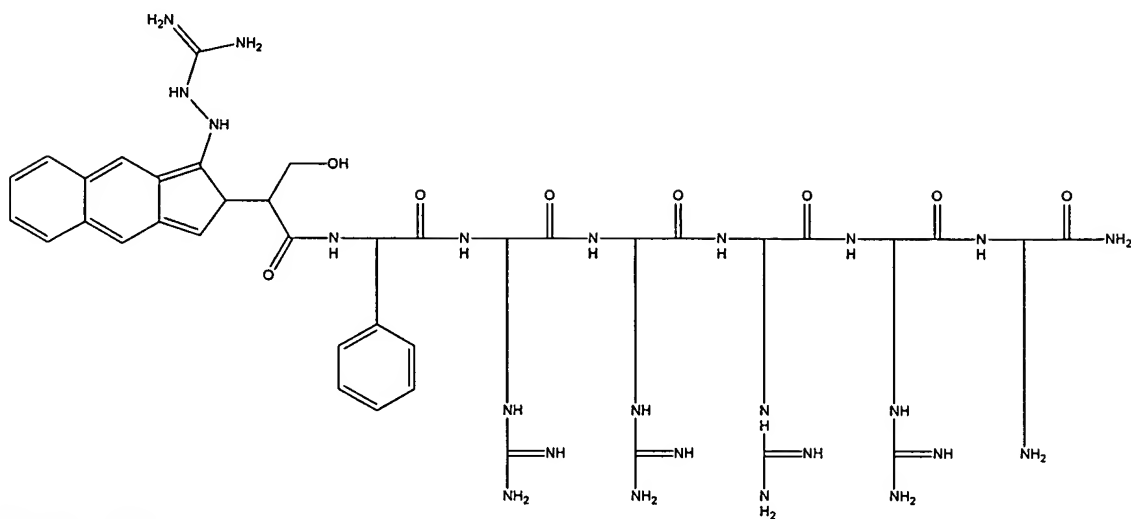


Compound 90

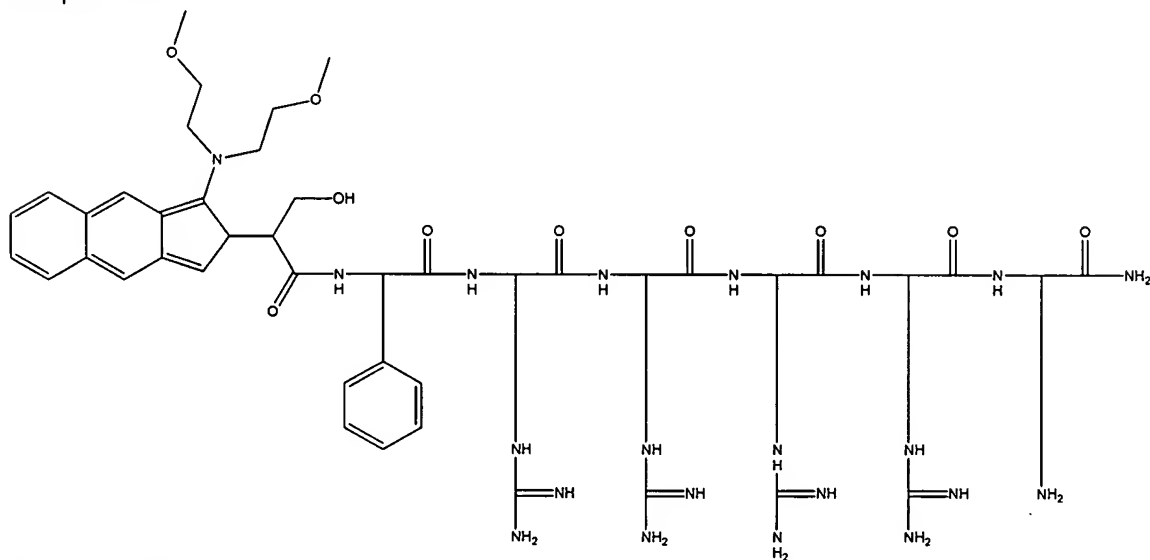


Compound 91

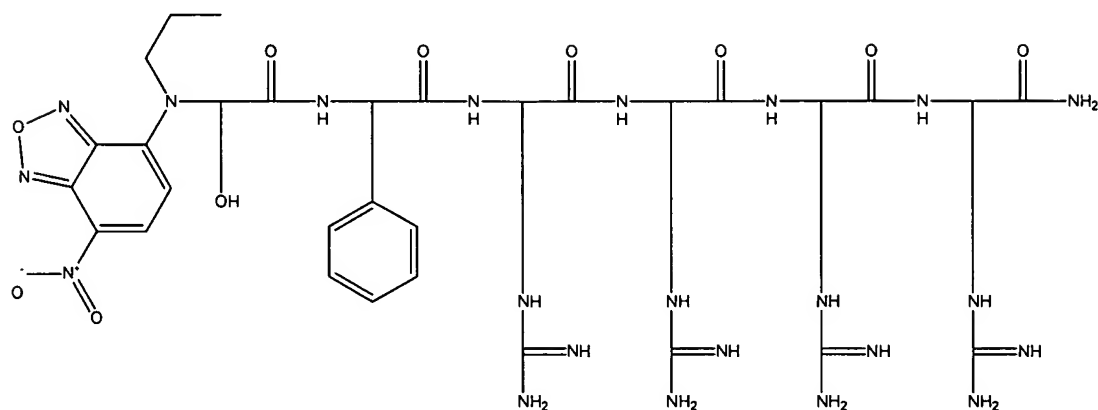
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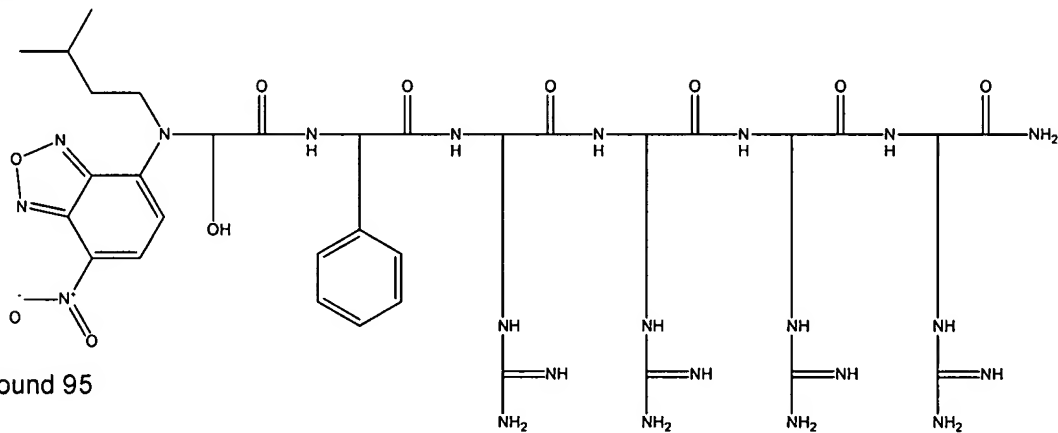
Compound 92



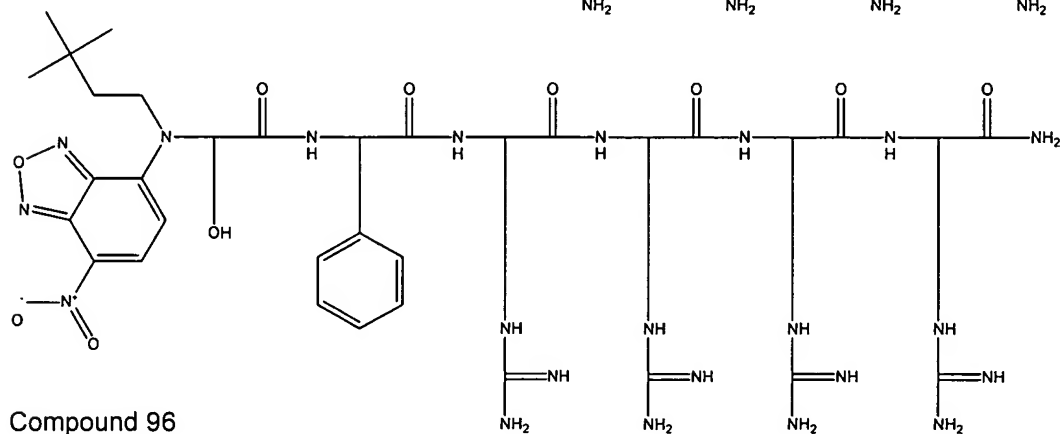
Compound 93



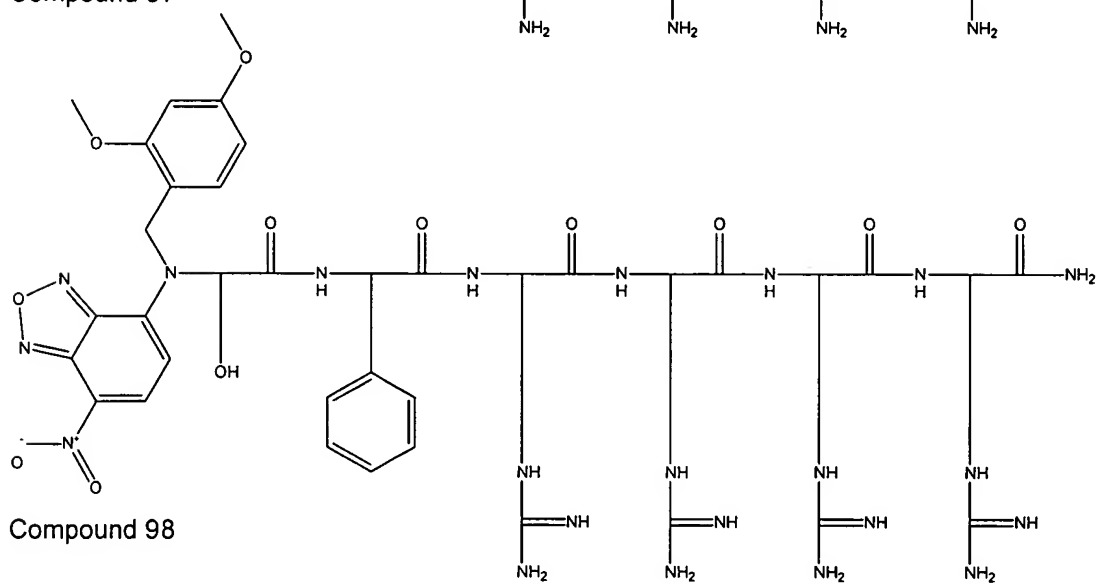
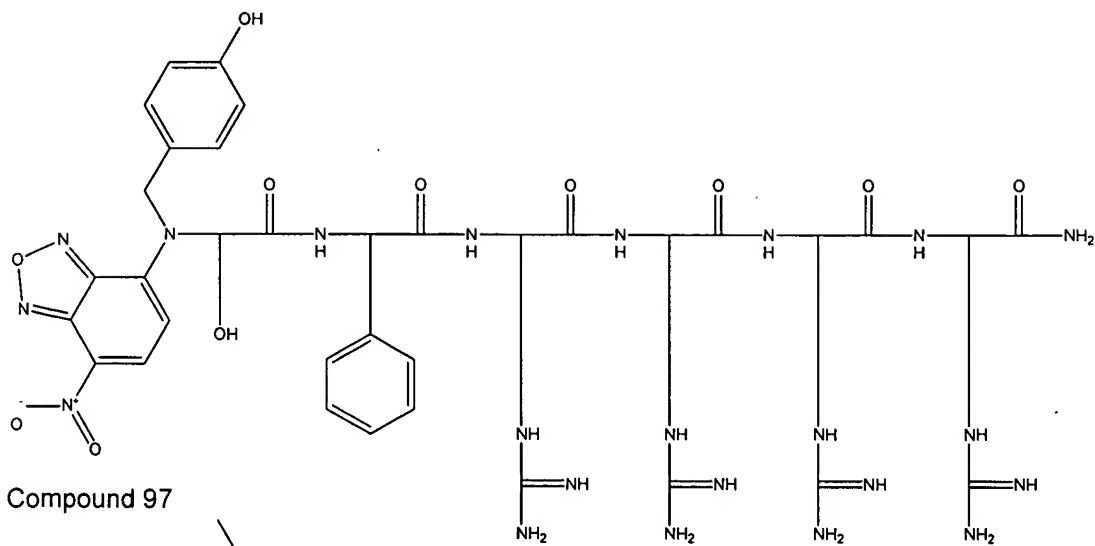
Compound 94



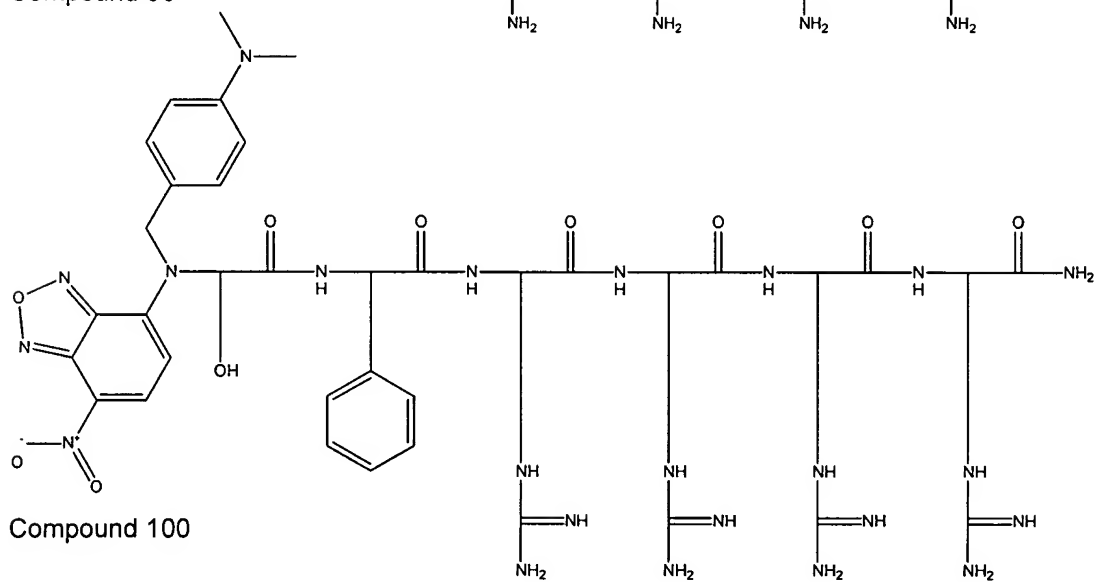
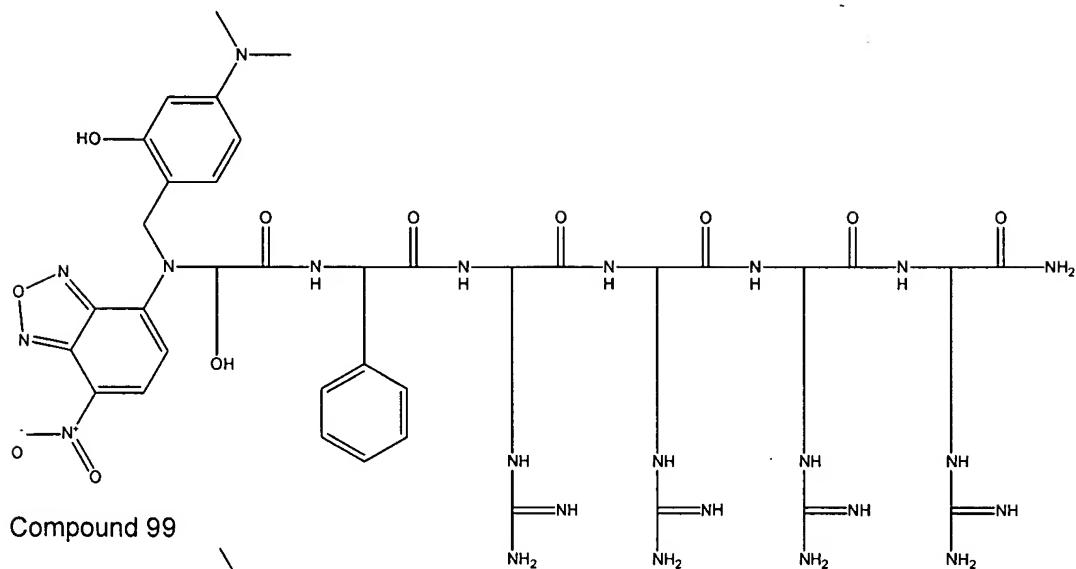
Compound 95

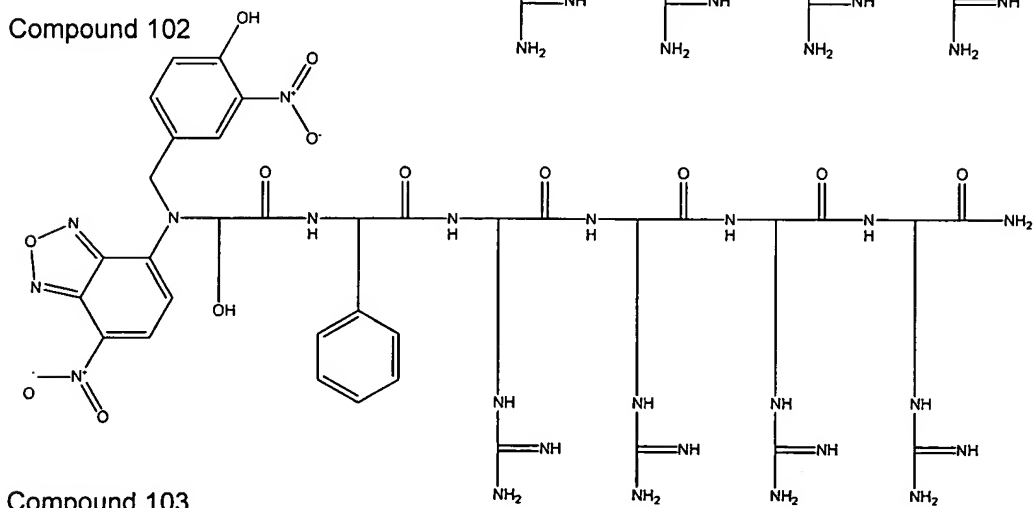
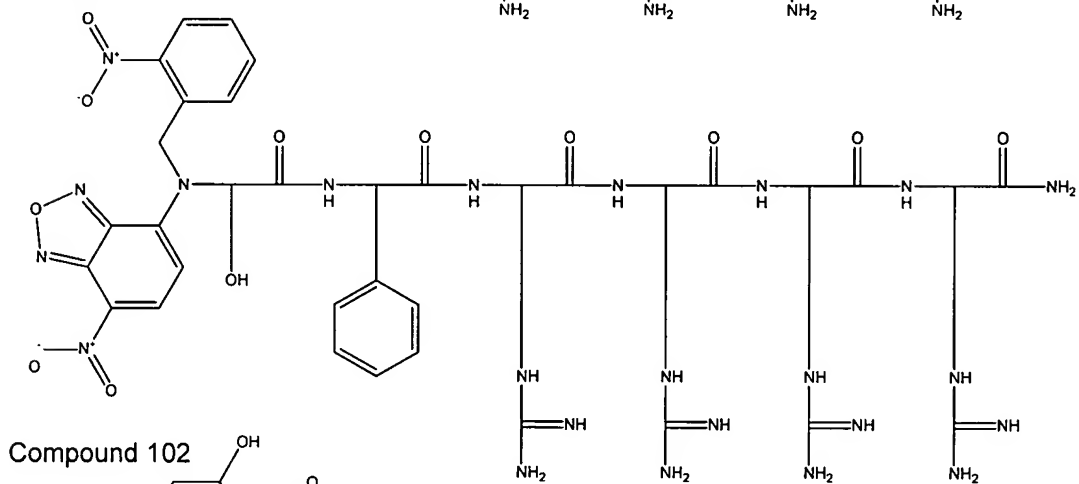
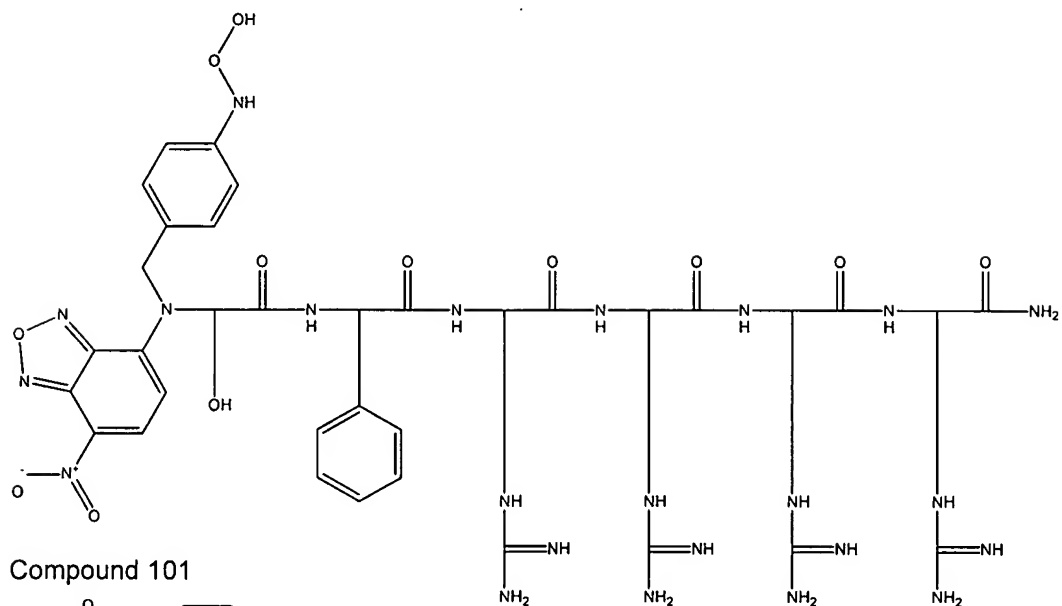


Compound 96

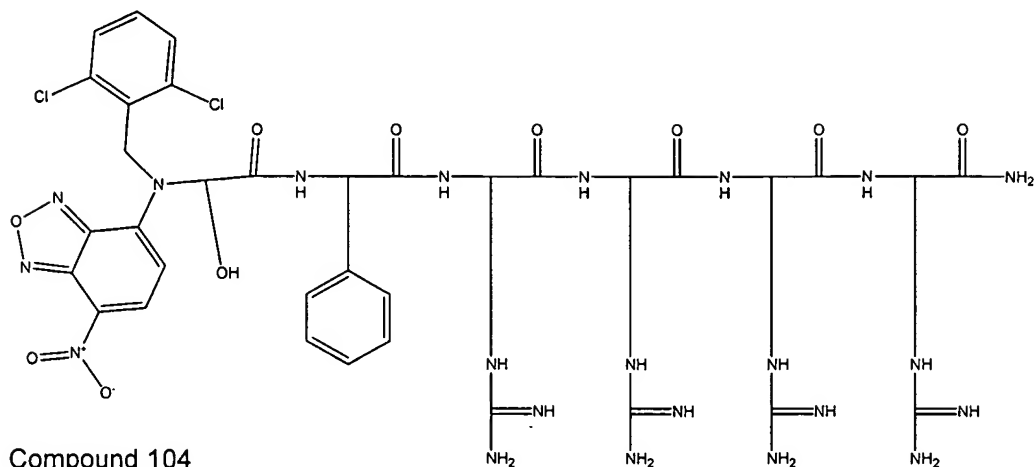


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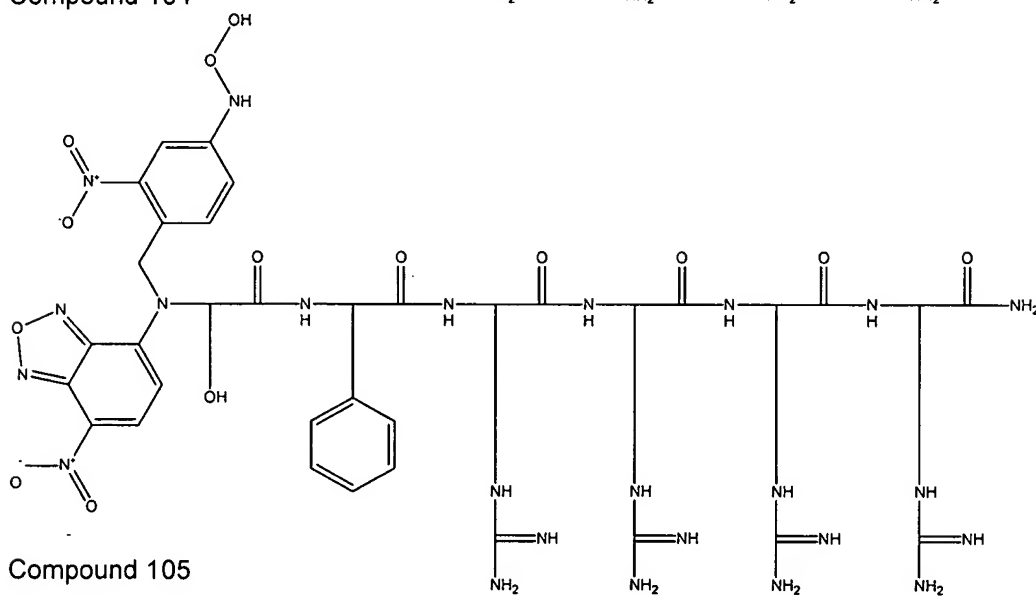




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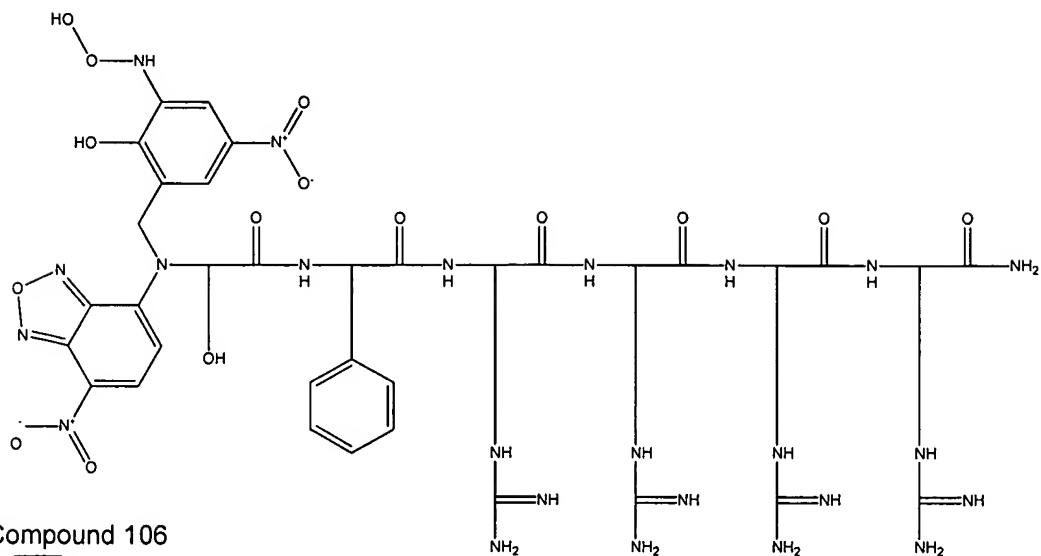


Compound 104

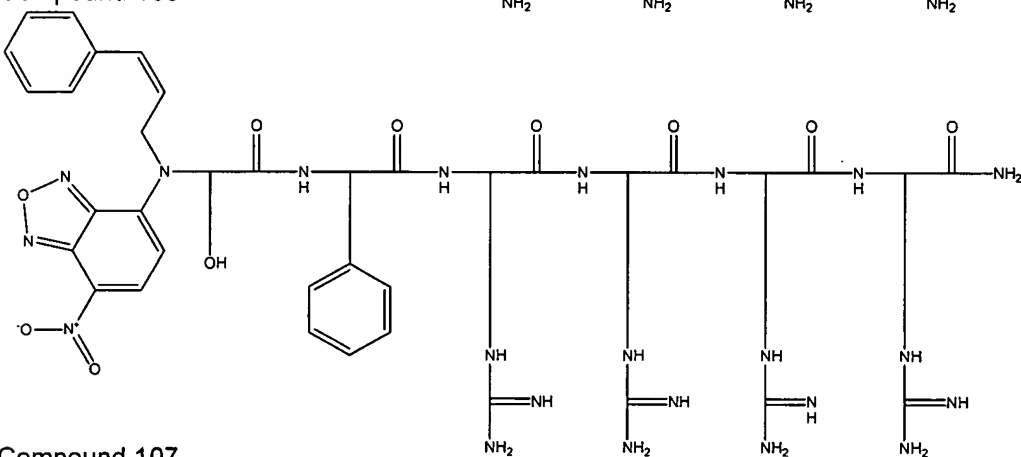


Compound 105

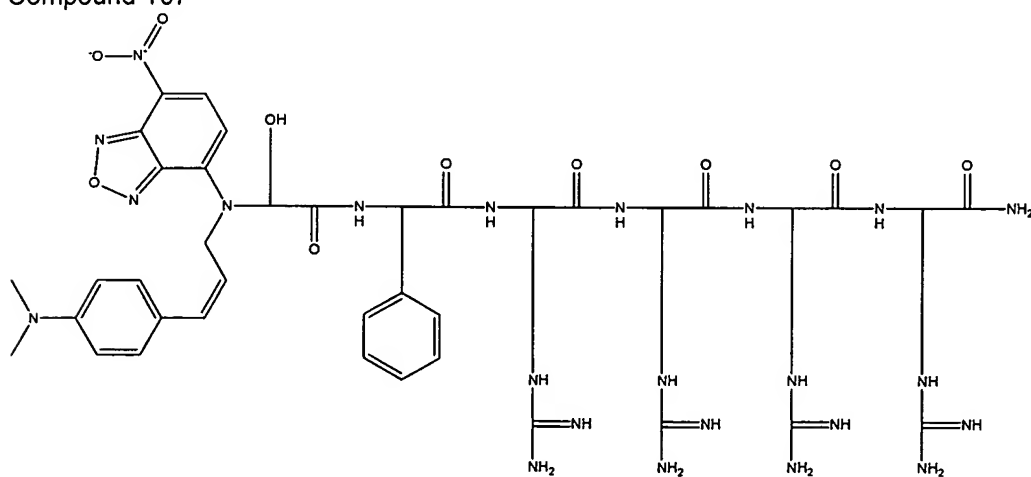




Compound 106

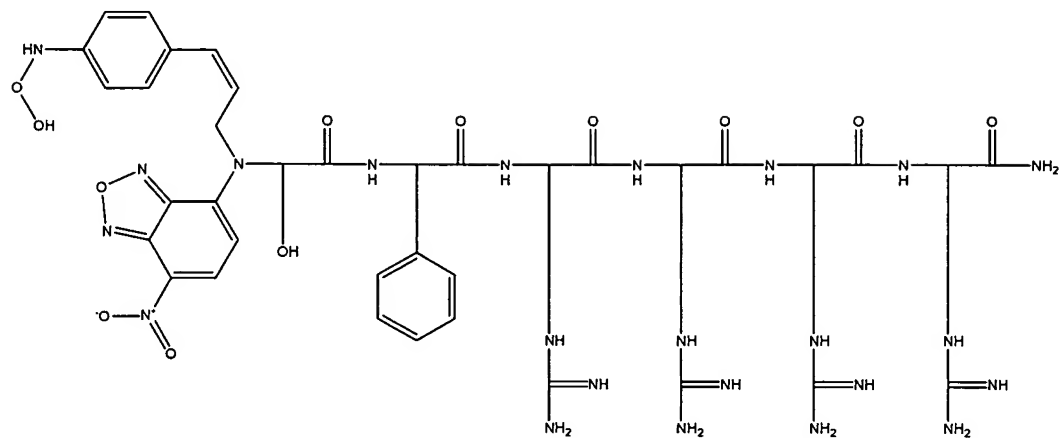


Compound 107

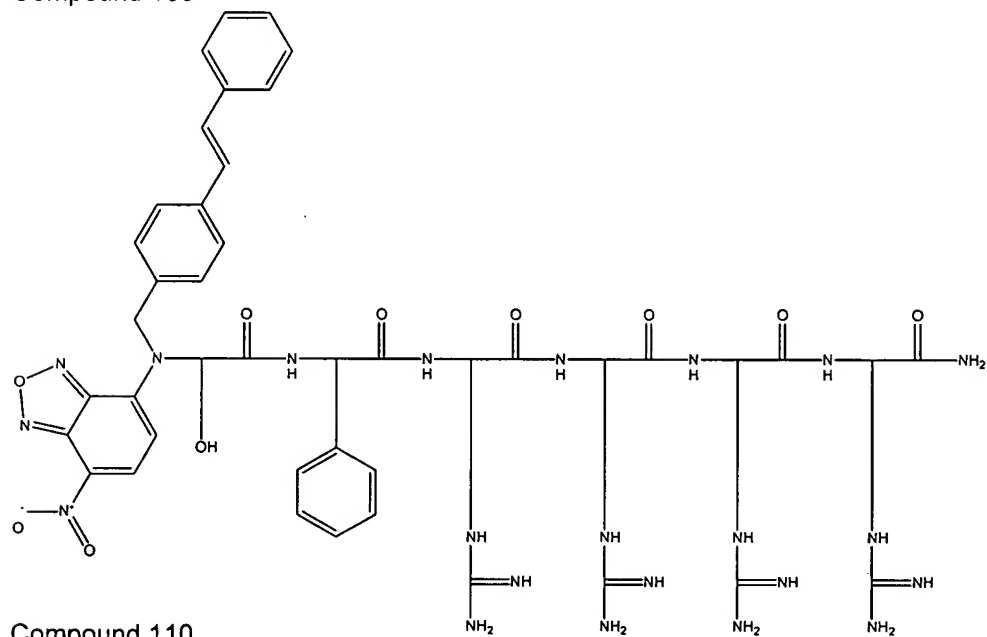


Compound 108

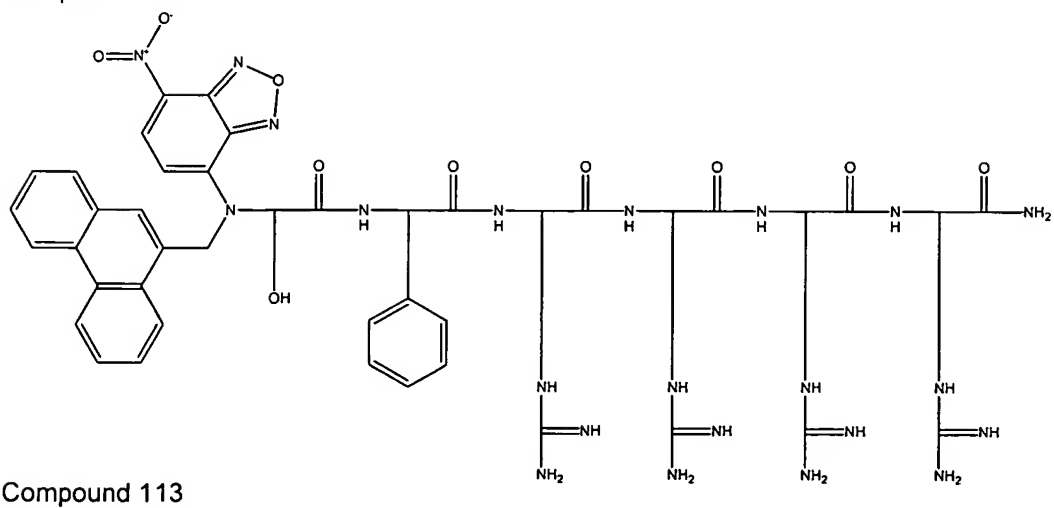
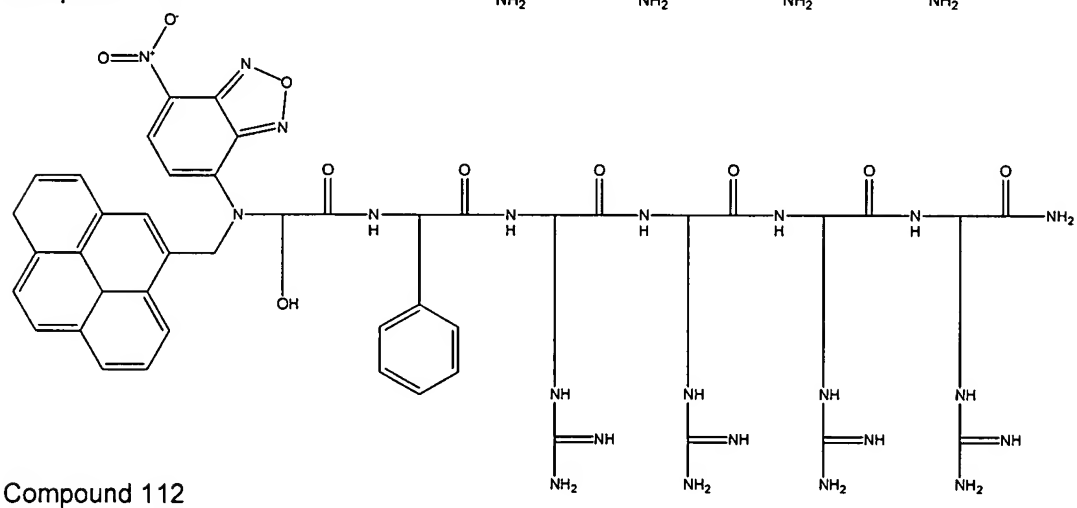
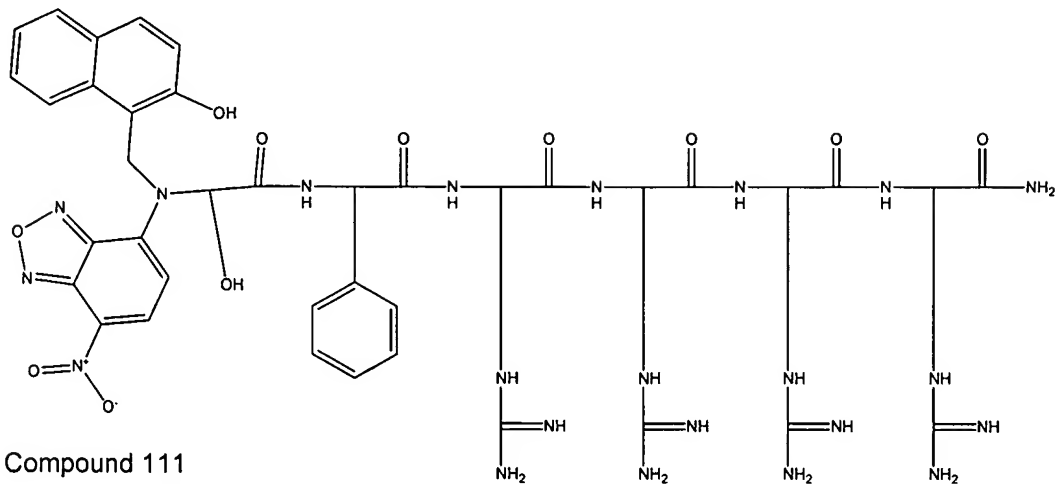
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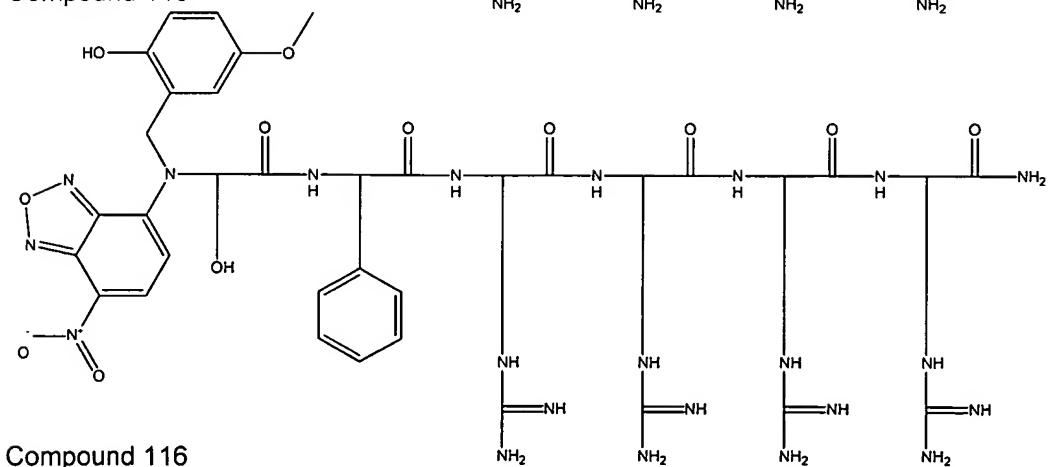
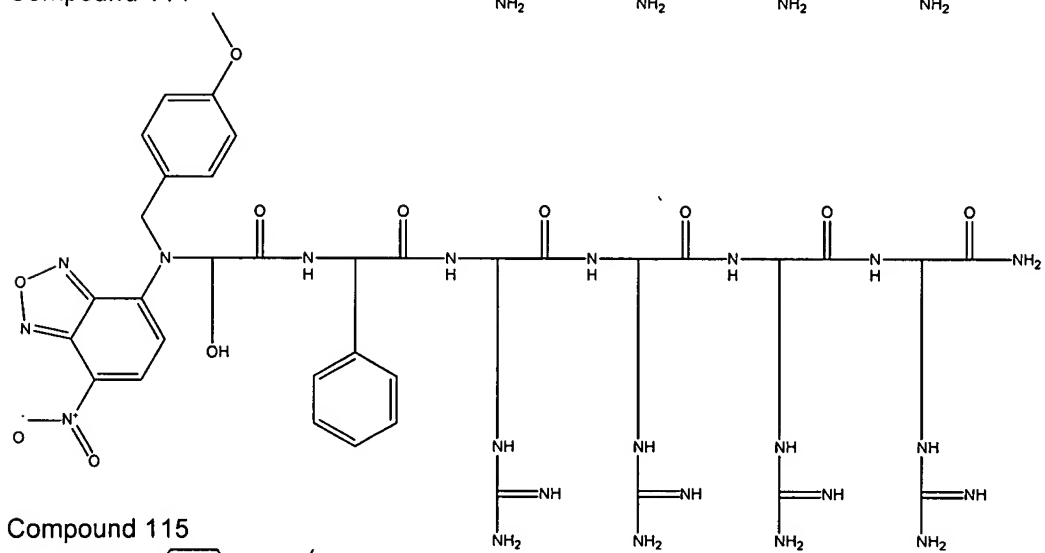
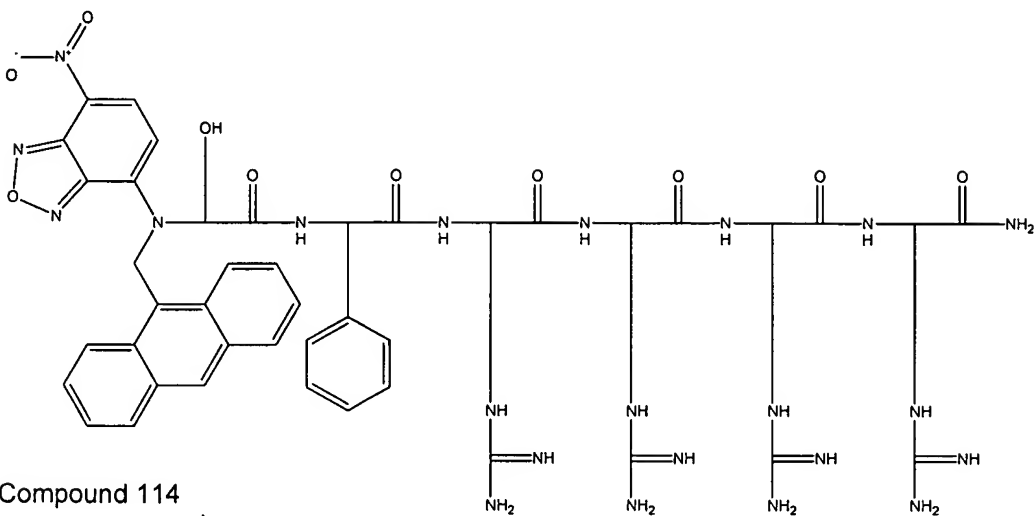


Compound 109

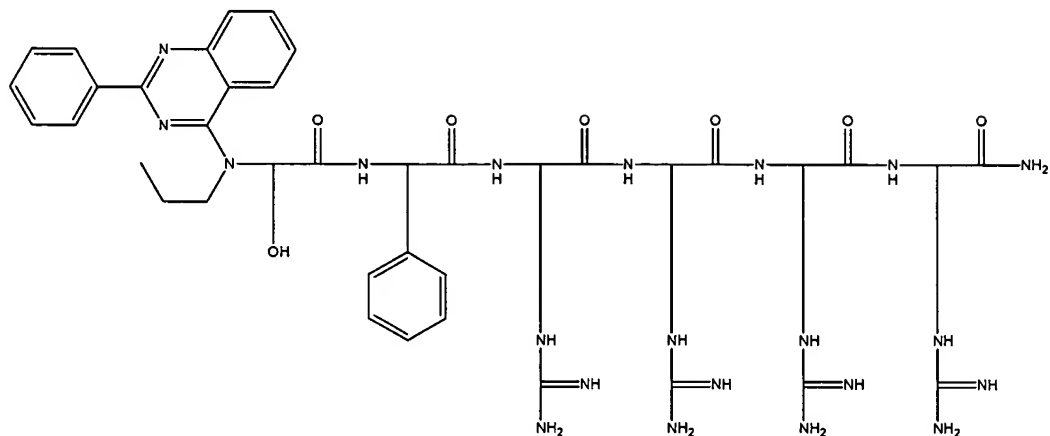


Compound 110

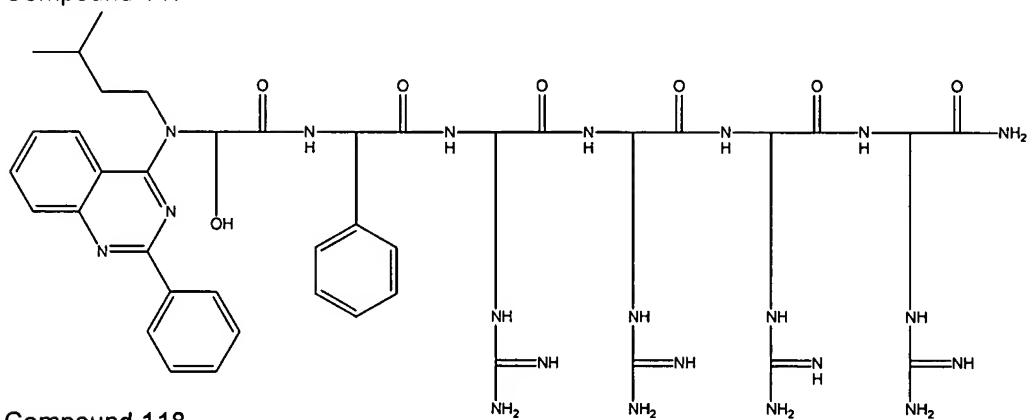




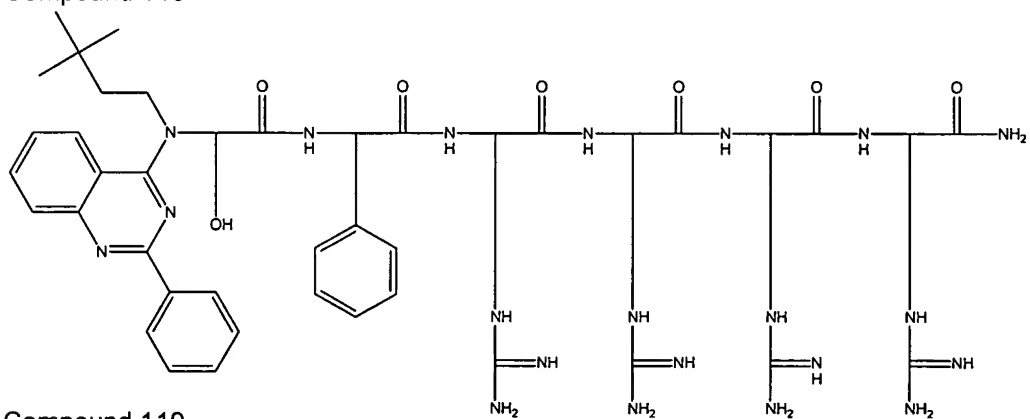
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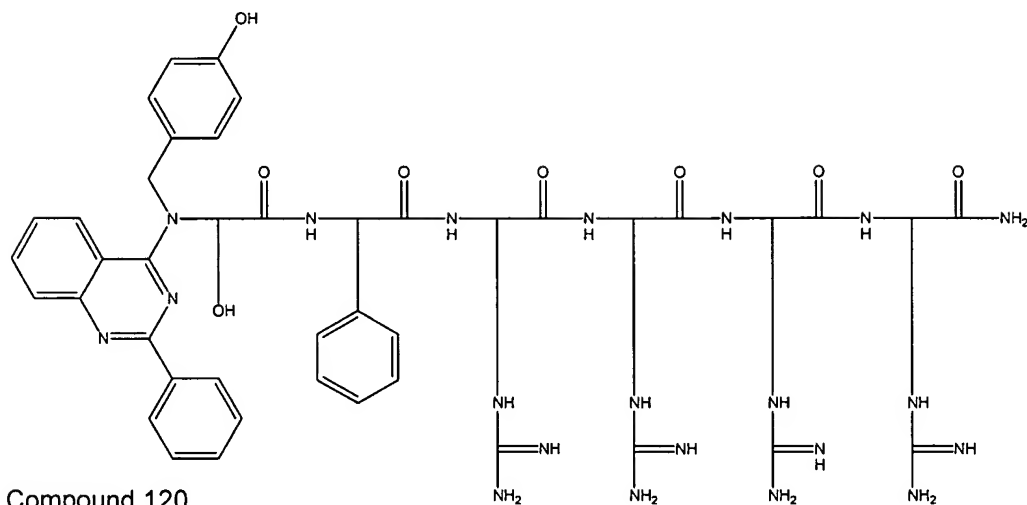
Compound 117



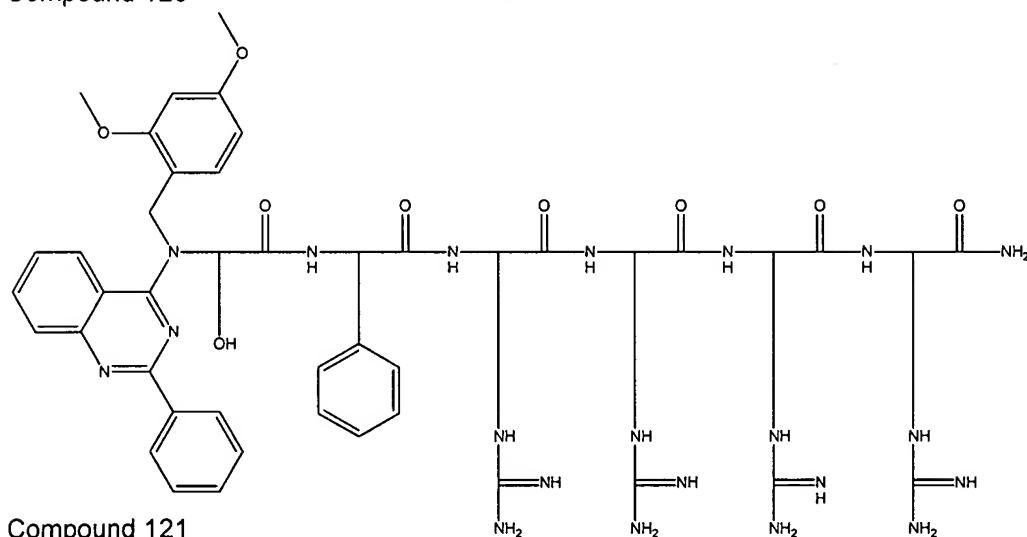
Compound 118



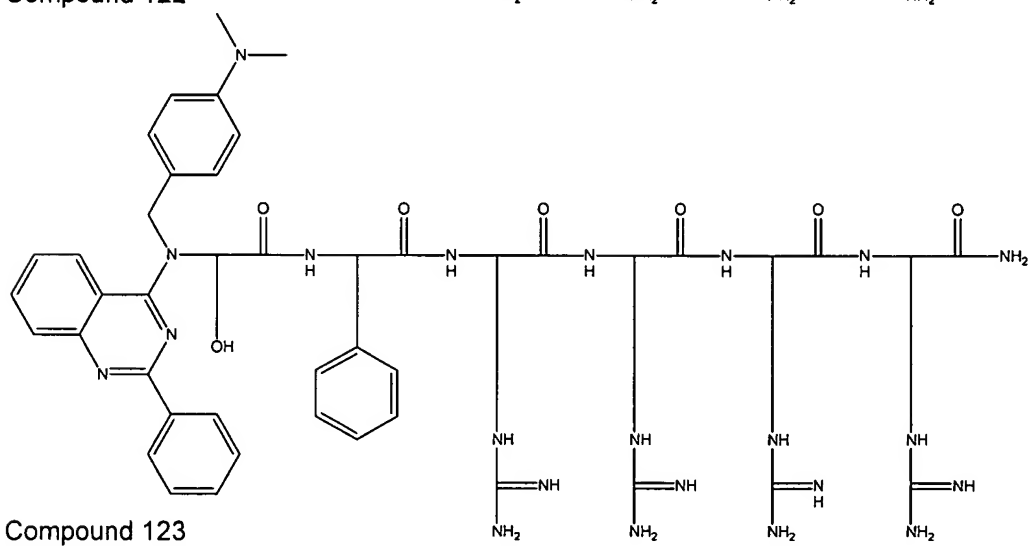
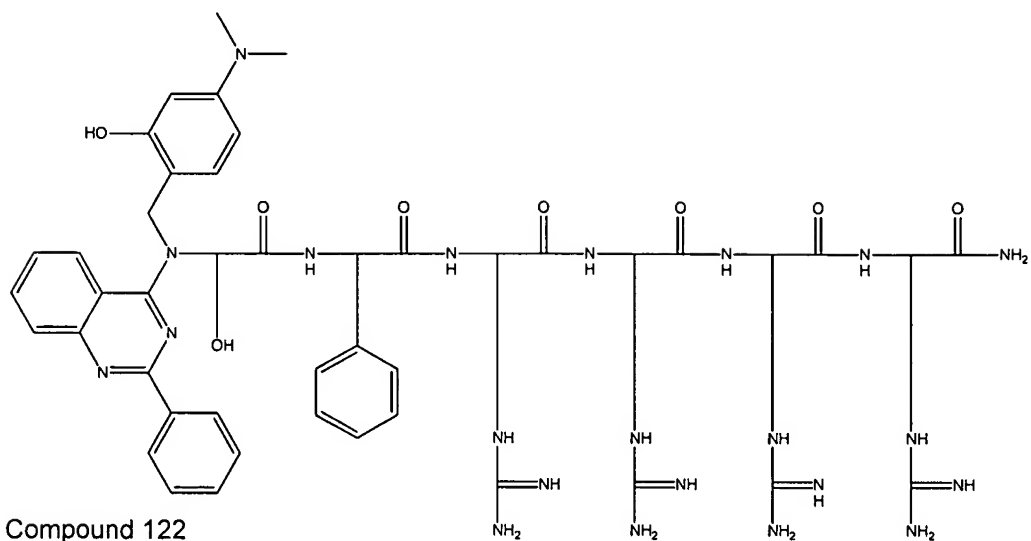
Compound 119

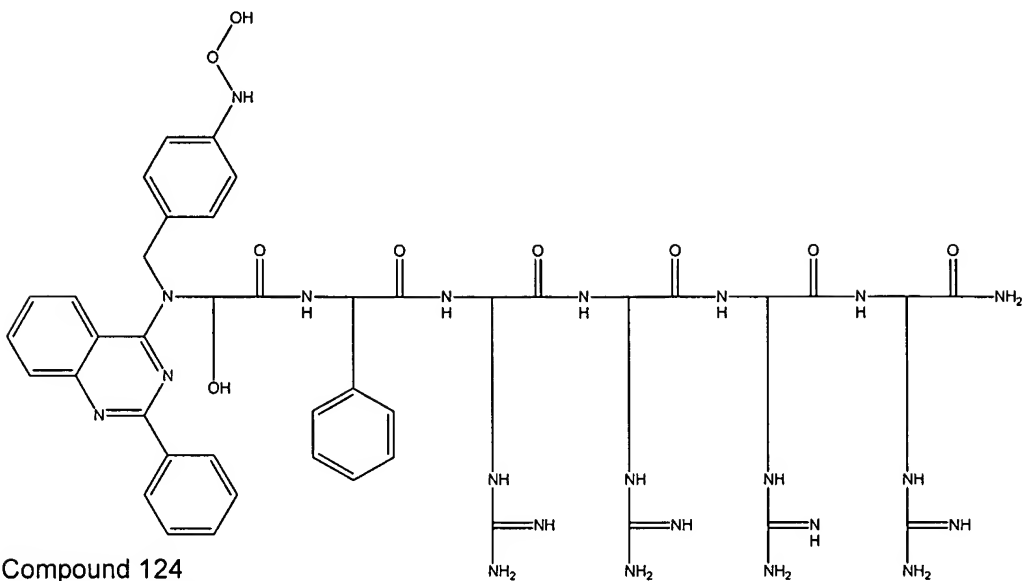


Compound 120

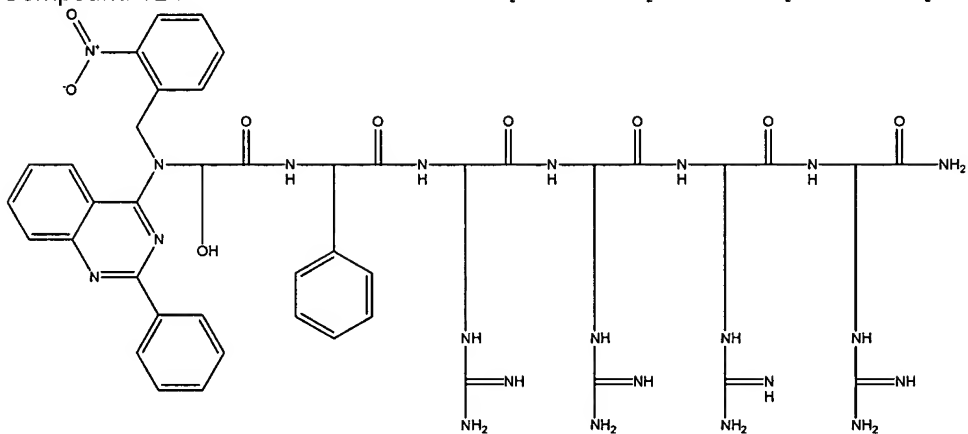


Compound 121



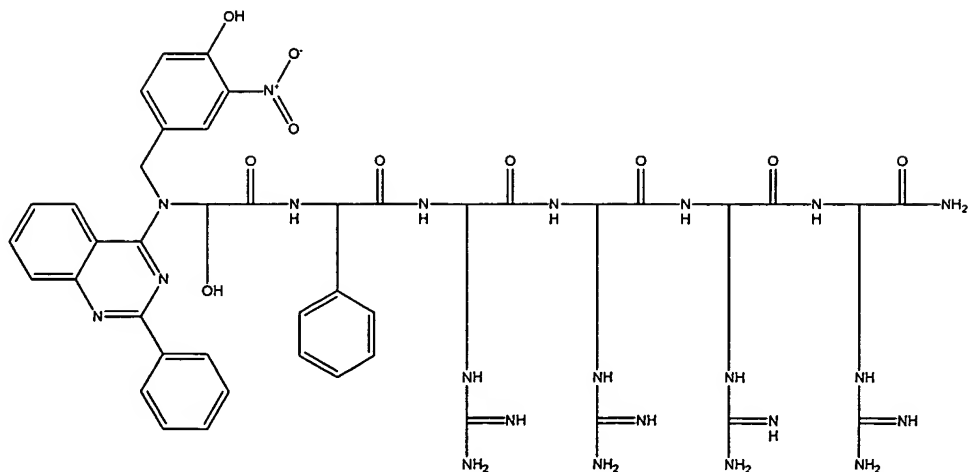


Compound 124

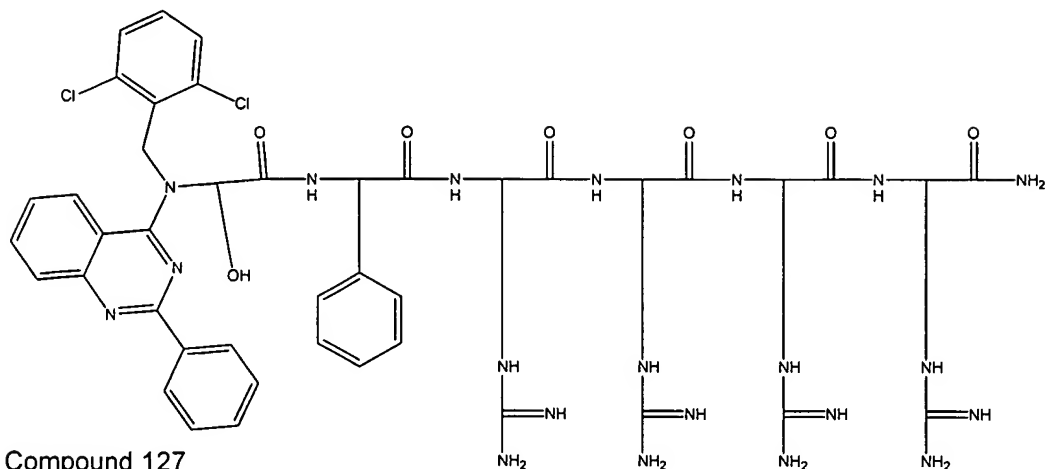


Compound 125

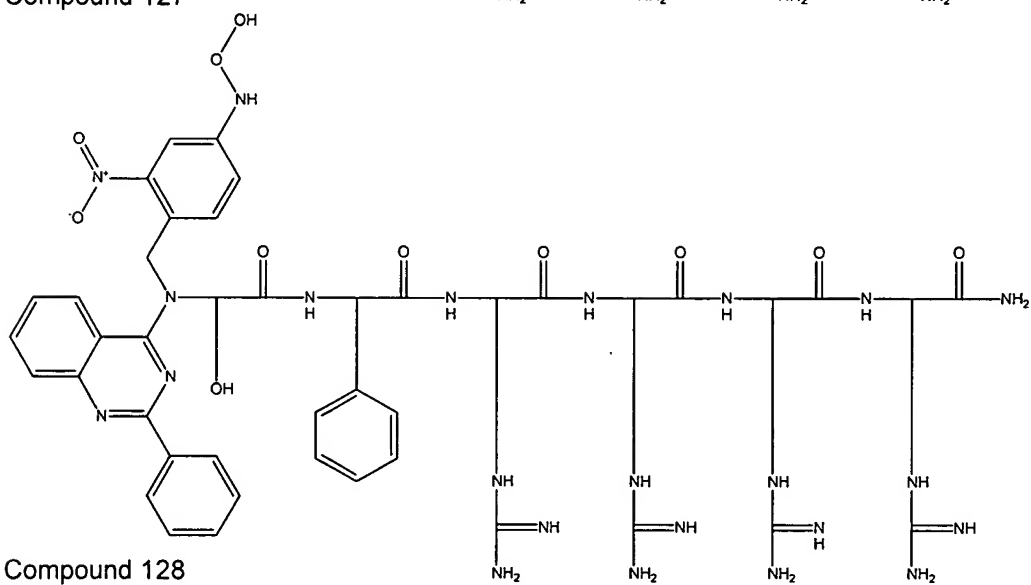
Compound 126





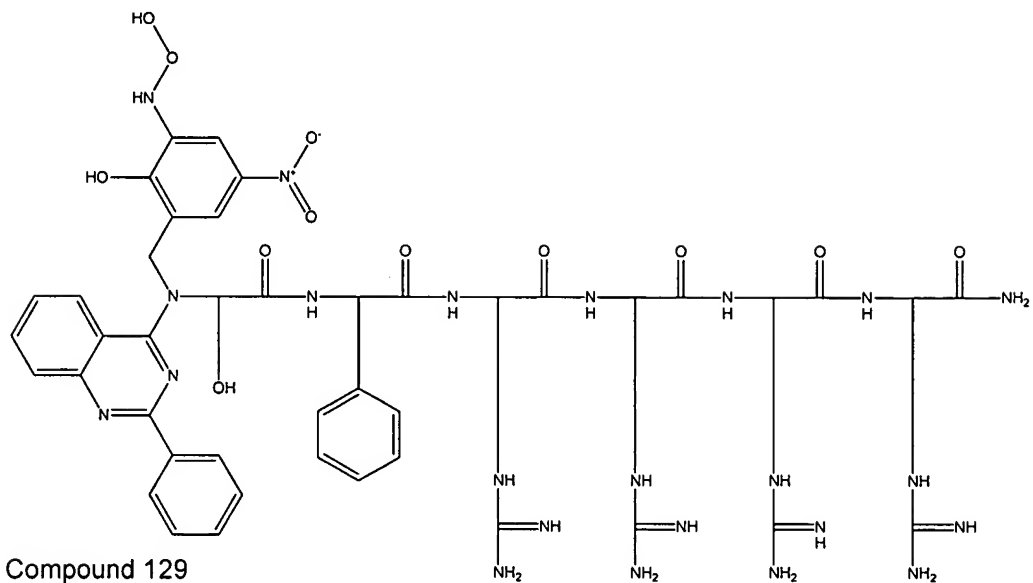


Compound 127

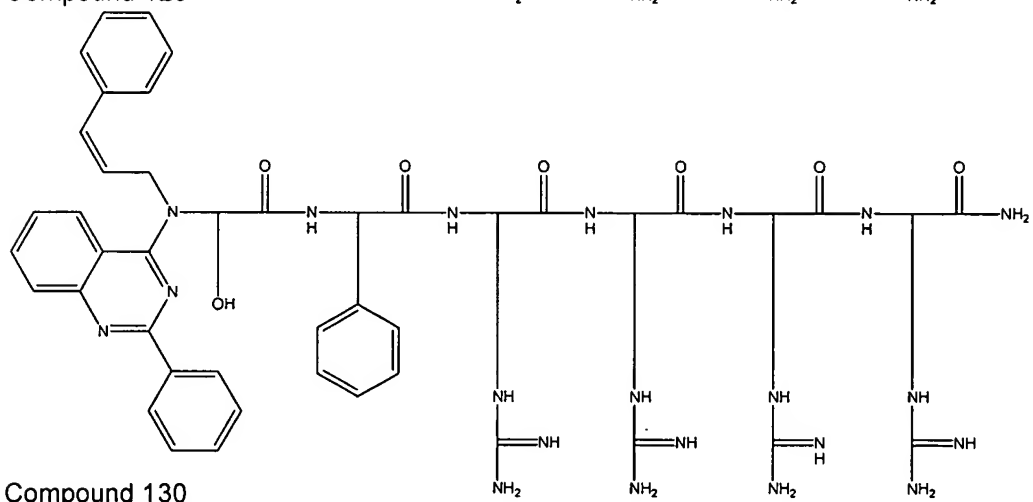


Compound 128

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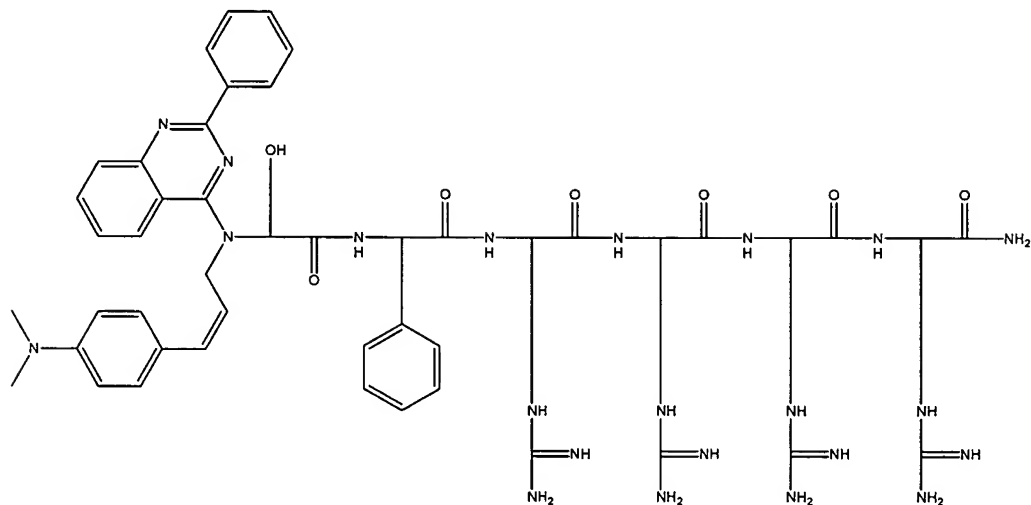


Compound 129

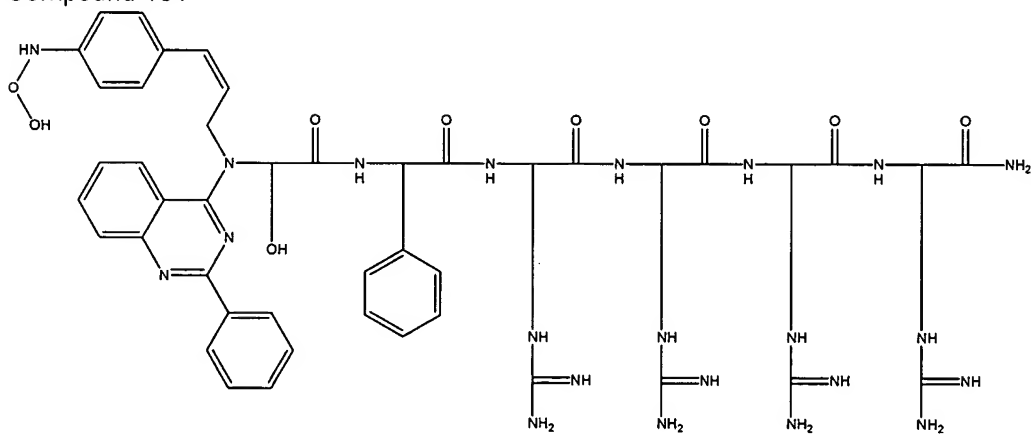


Compound 130

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Compound 131

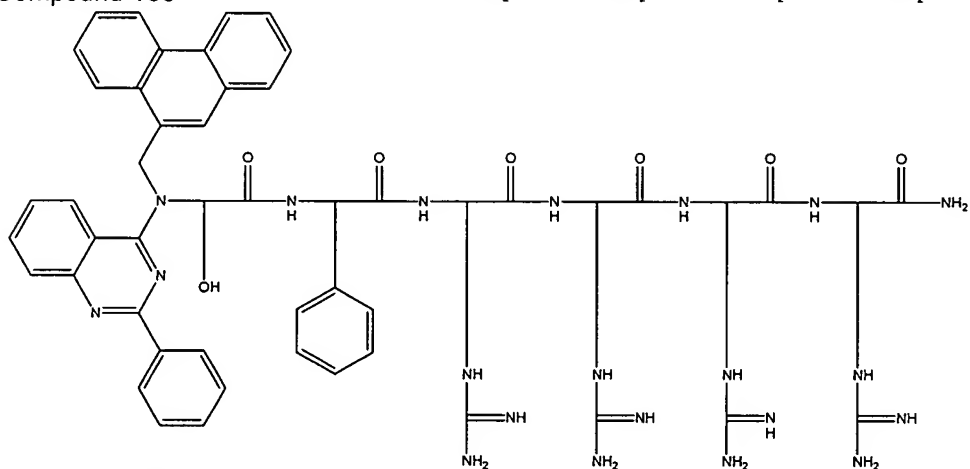
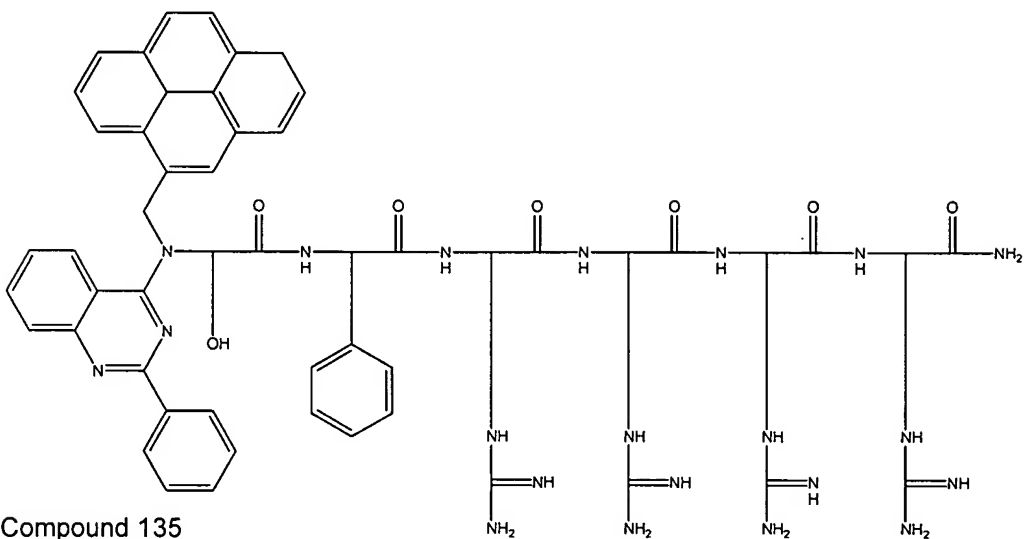


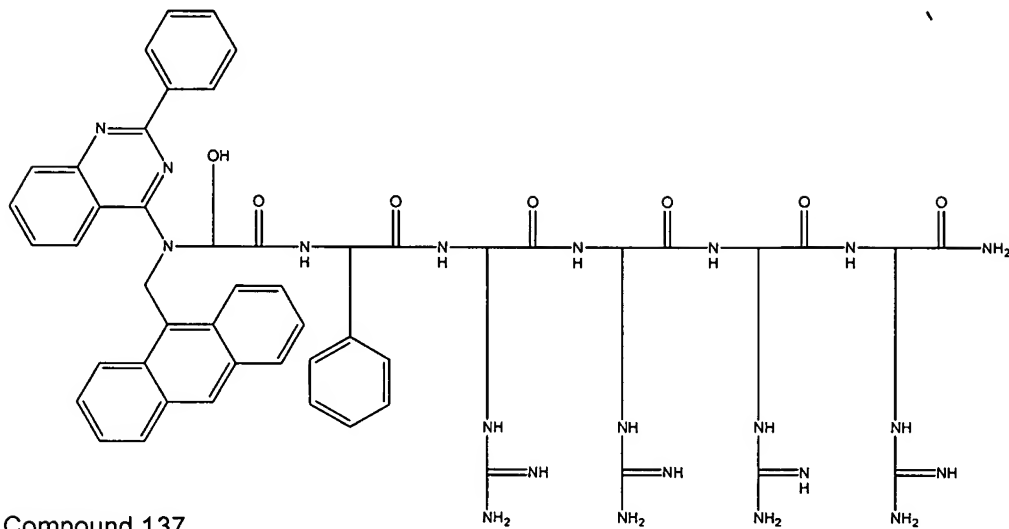
Compound 132

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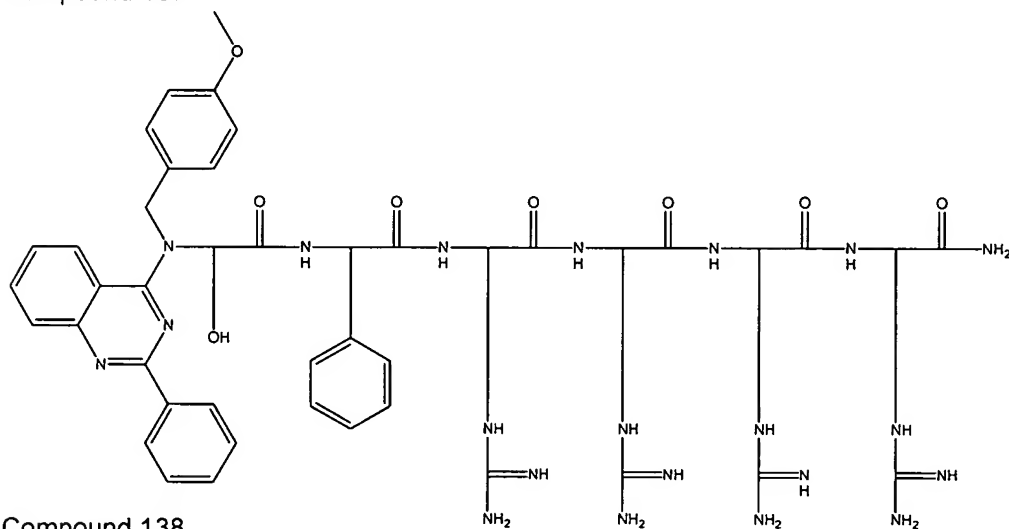


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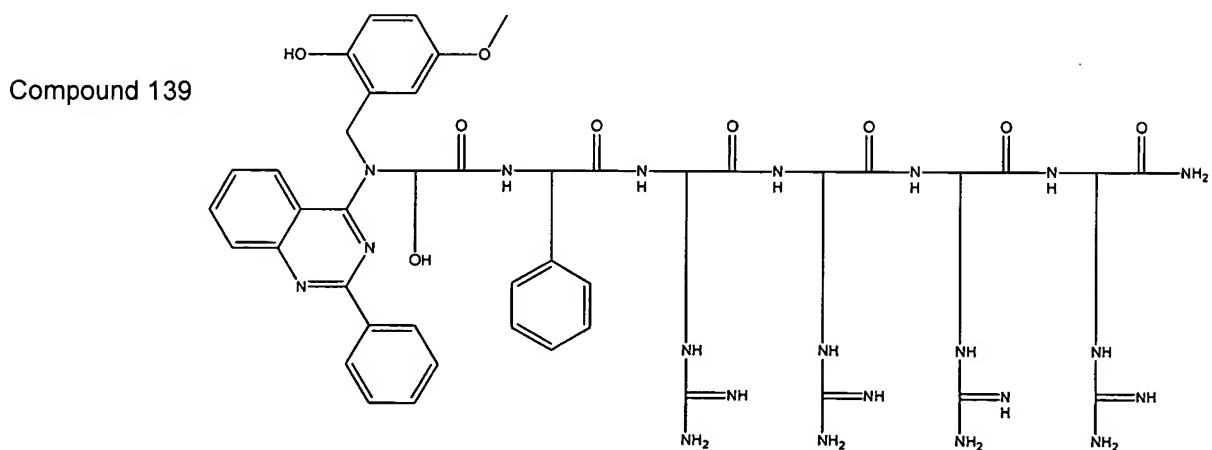




Compound 137



Compound 138

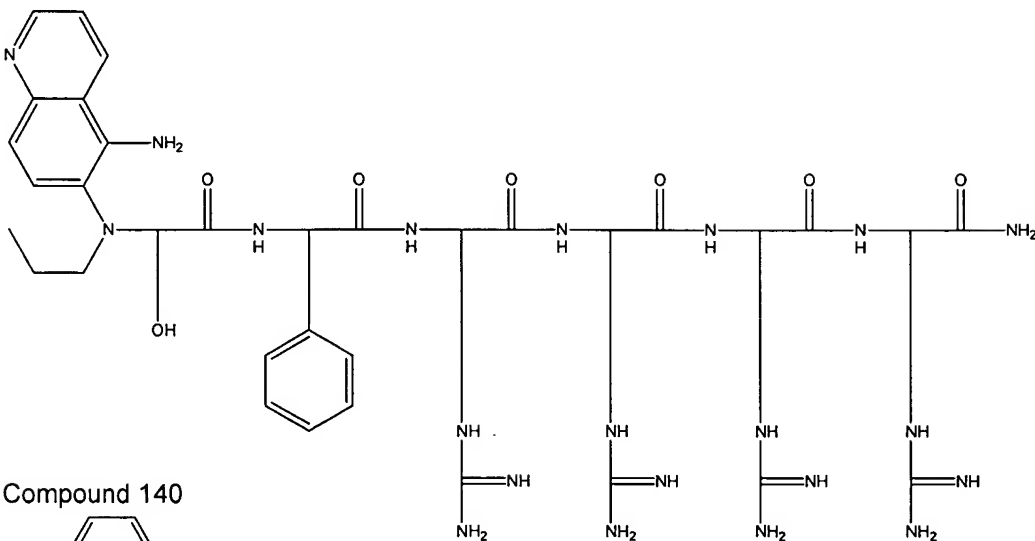


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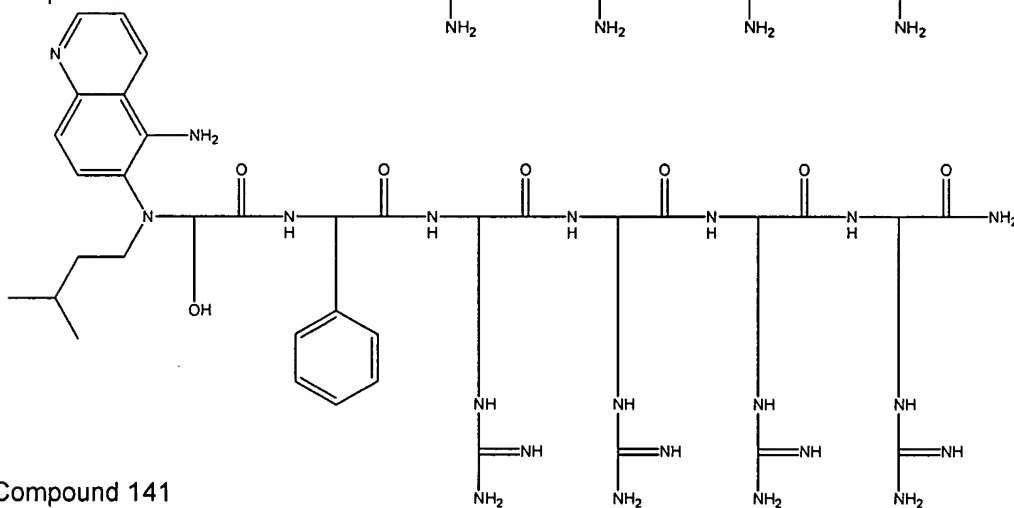
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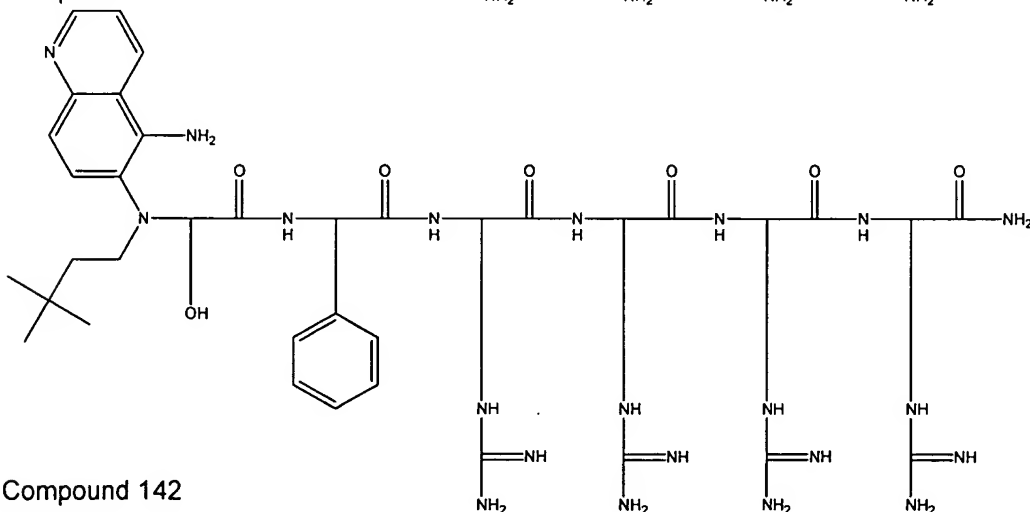
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Compound 140



Compound 141



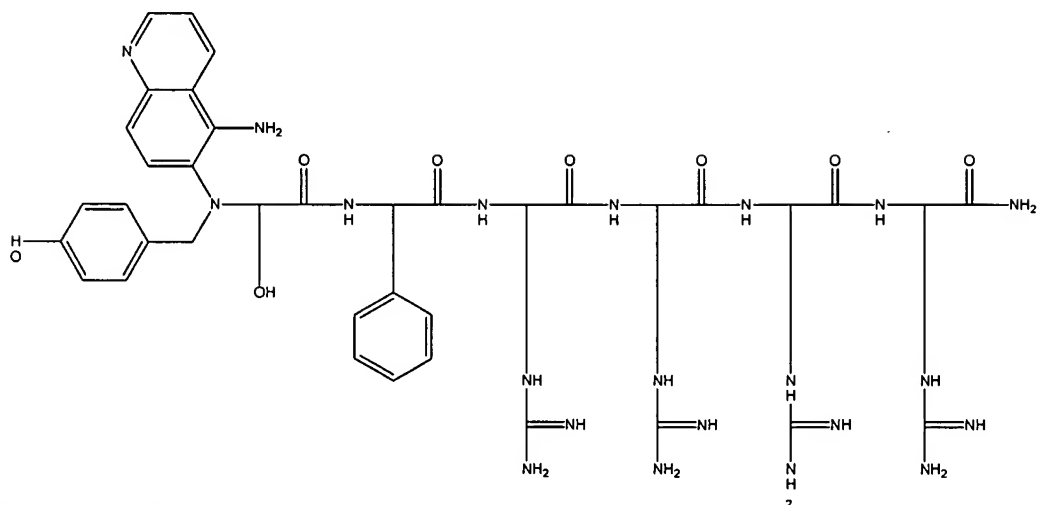
Compound 142

Applicant: David S. Lawrence

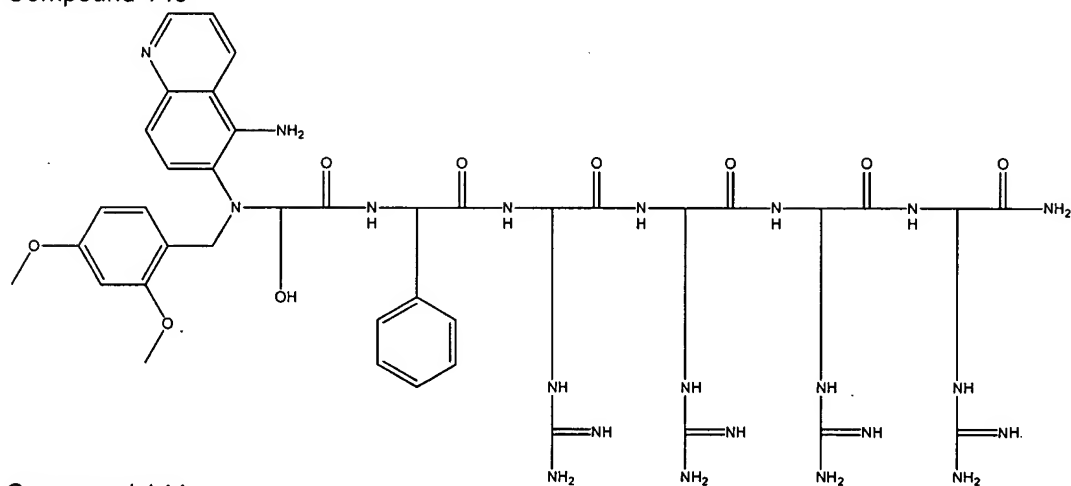
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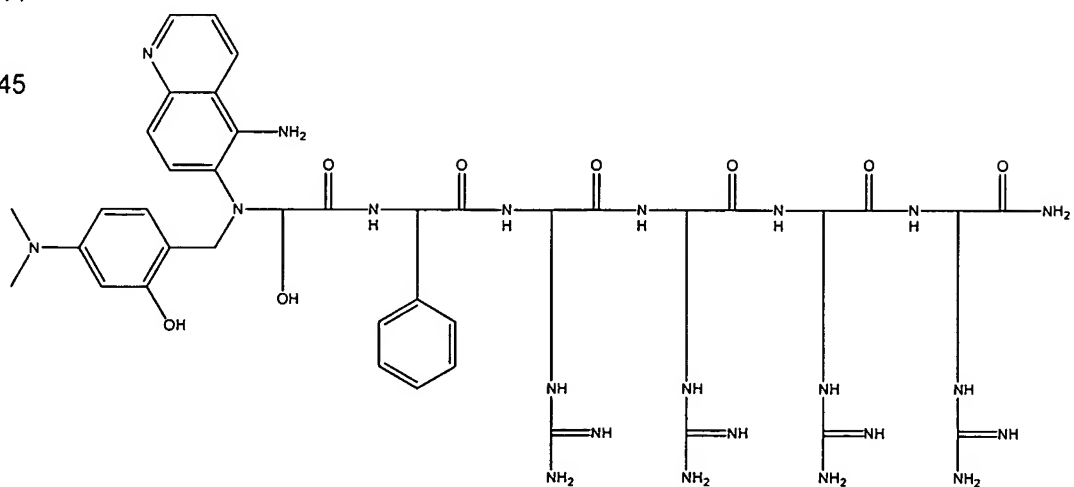


Compound 143

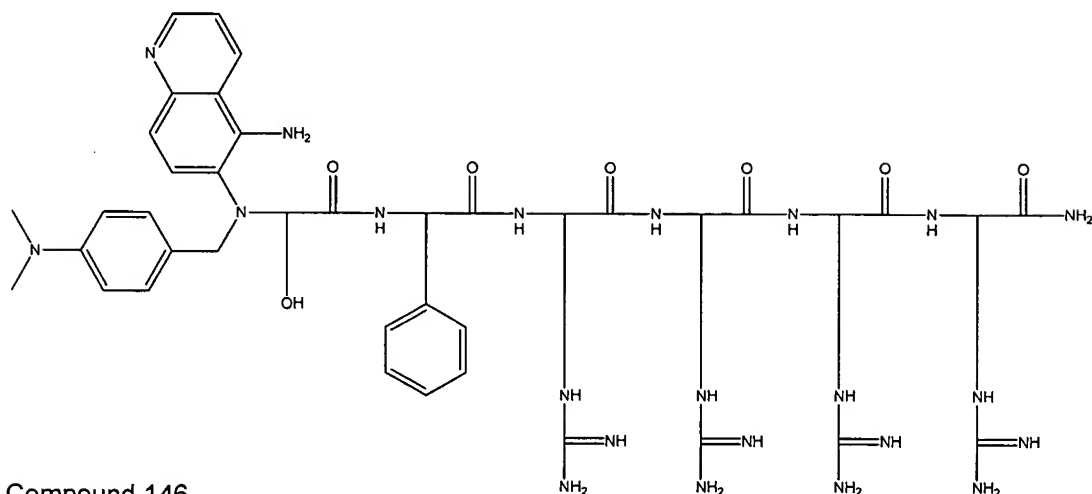


Compound 144

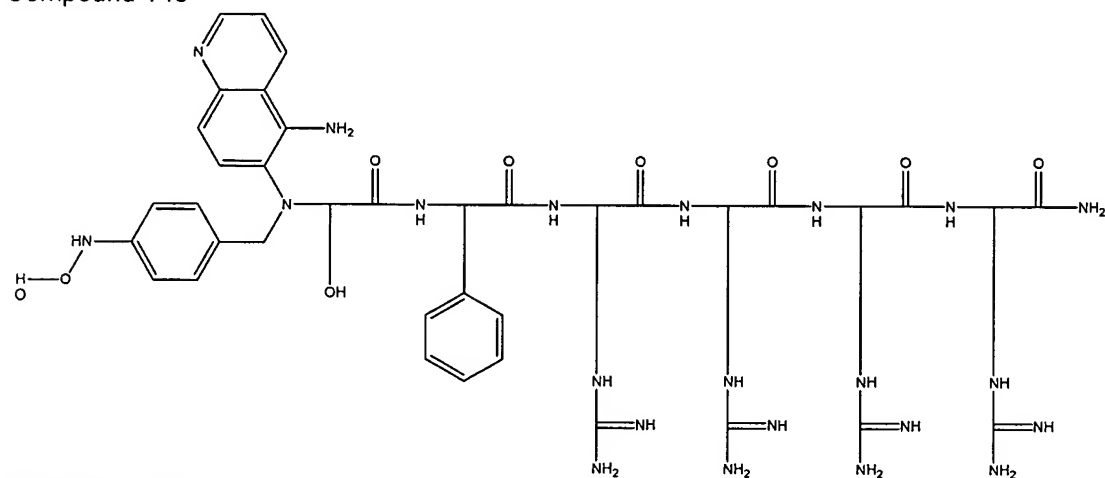
Compound 145



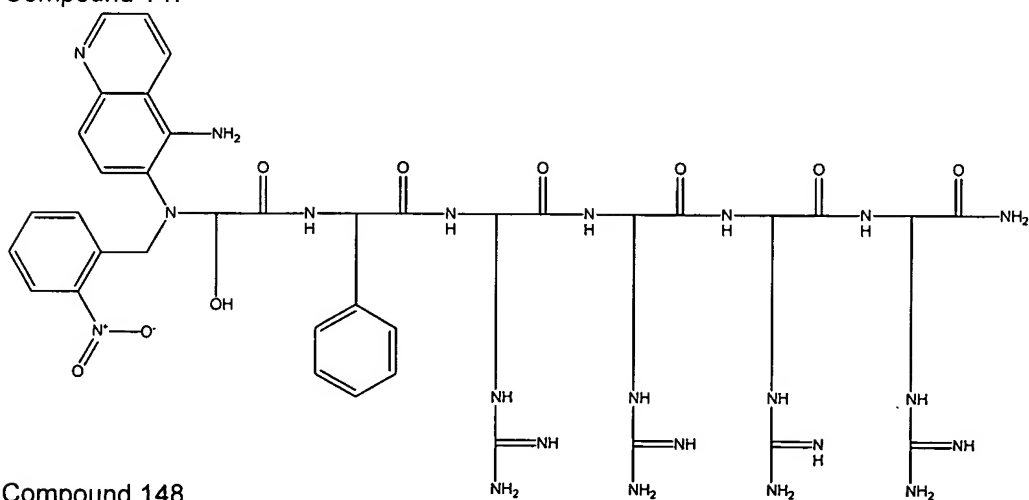




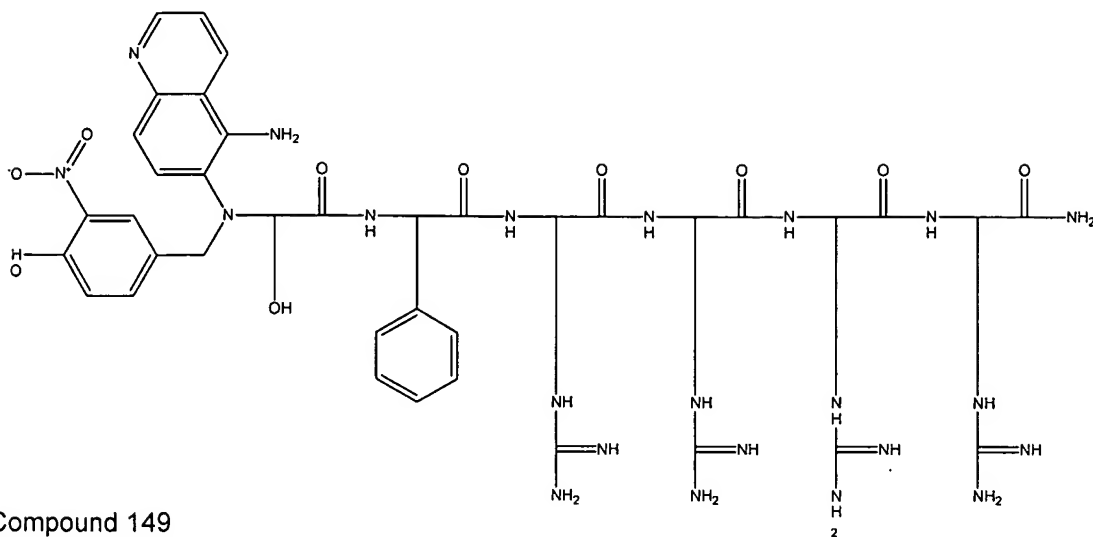
Compound 146



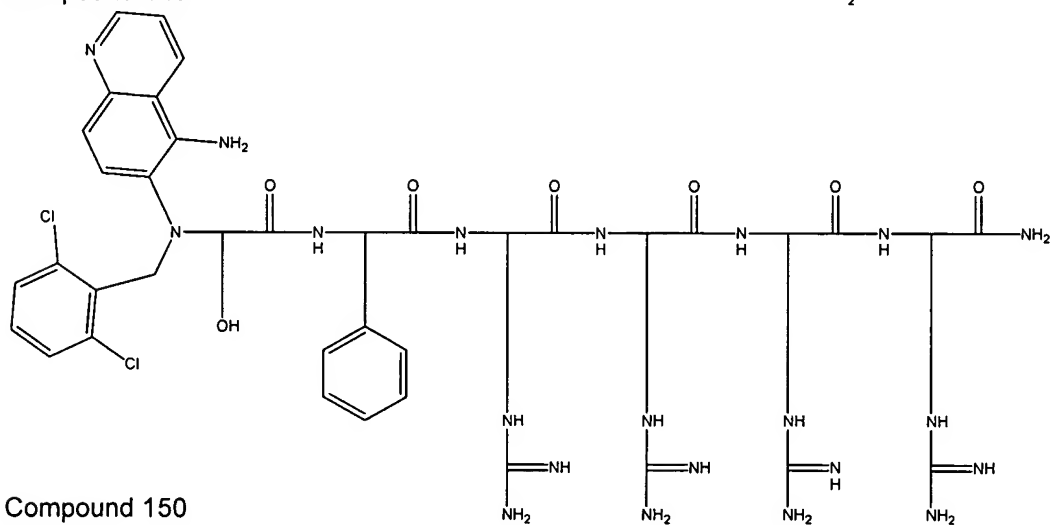
Compound 147



Compound 148

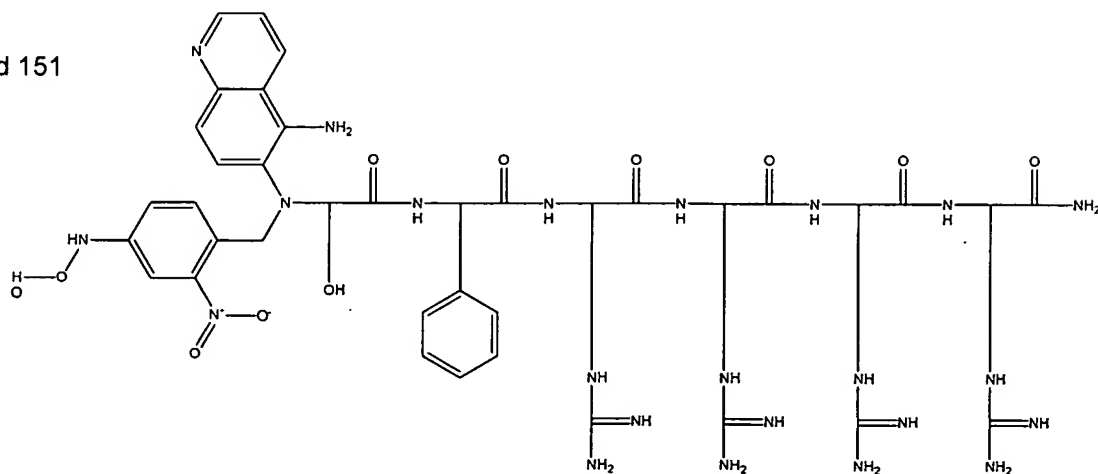


Compound 149



Compound 150

Compound 151

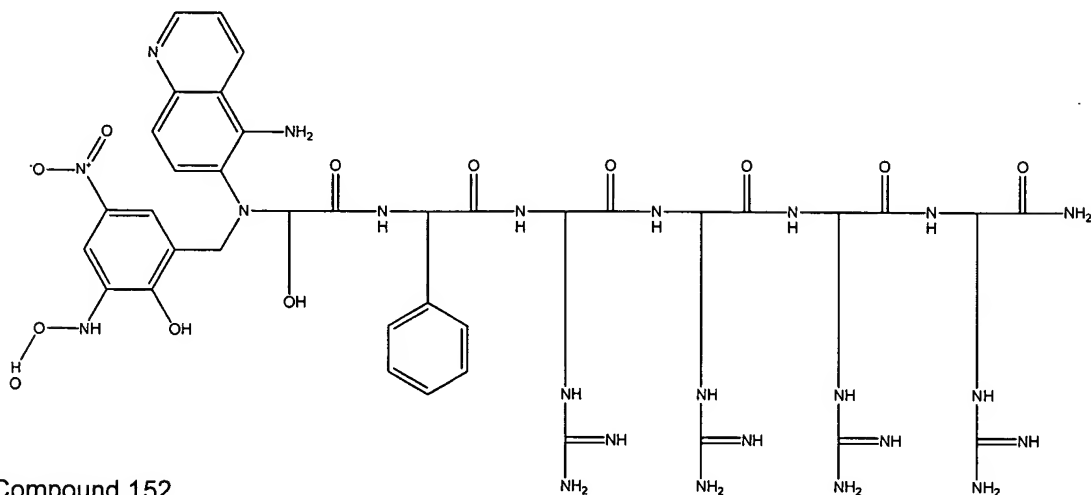


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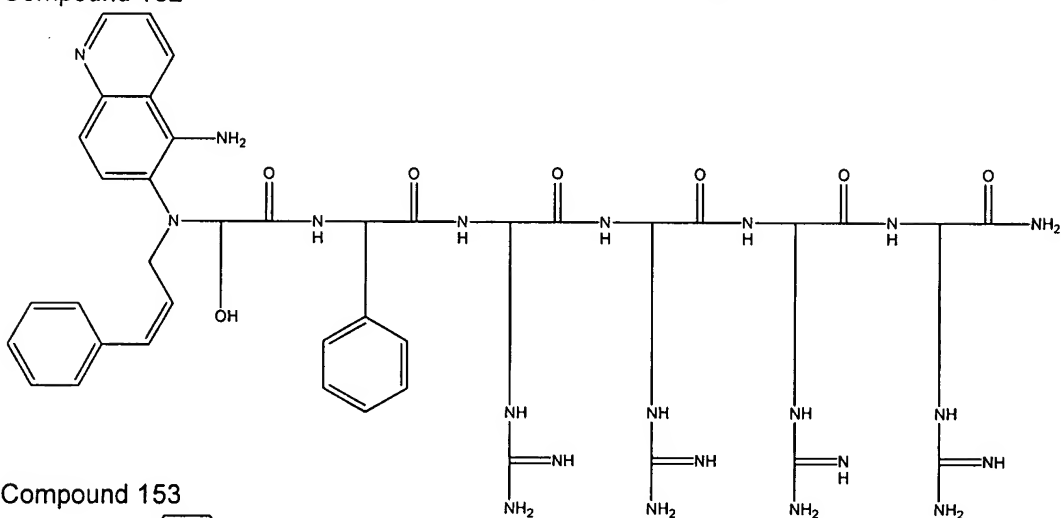
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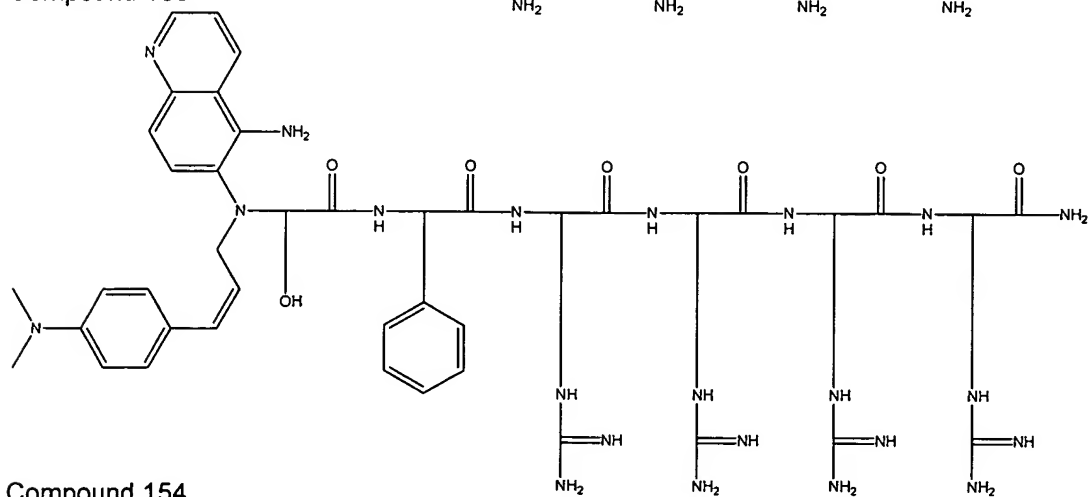
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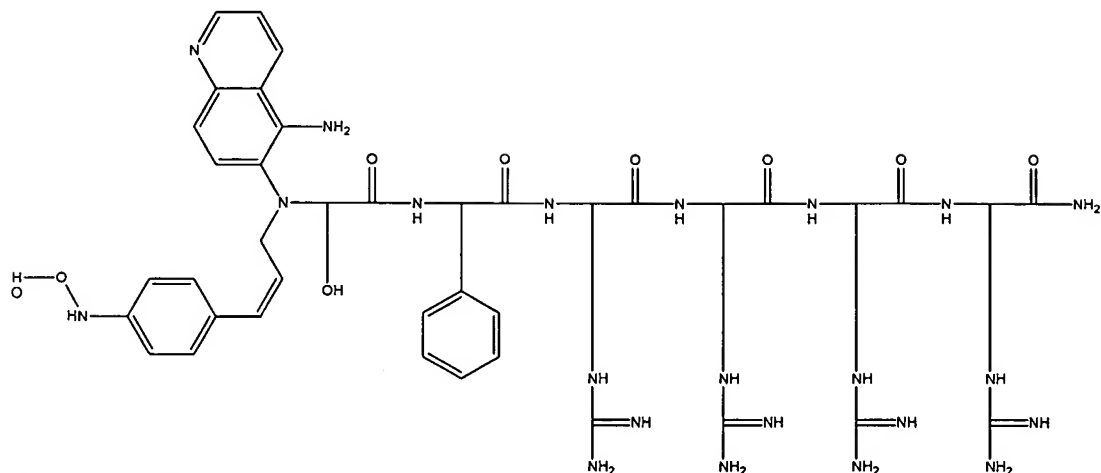
Compound 152



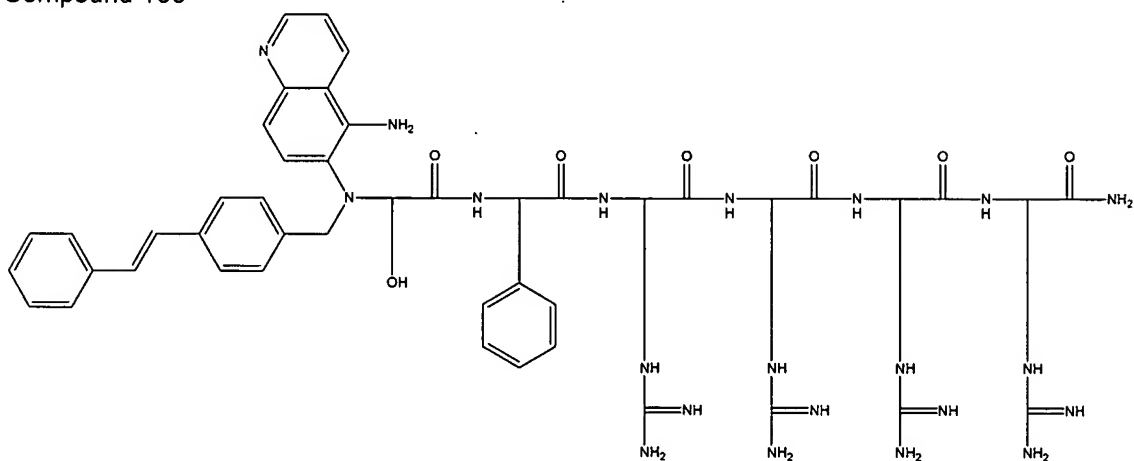
Compound 153



Compound 154

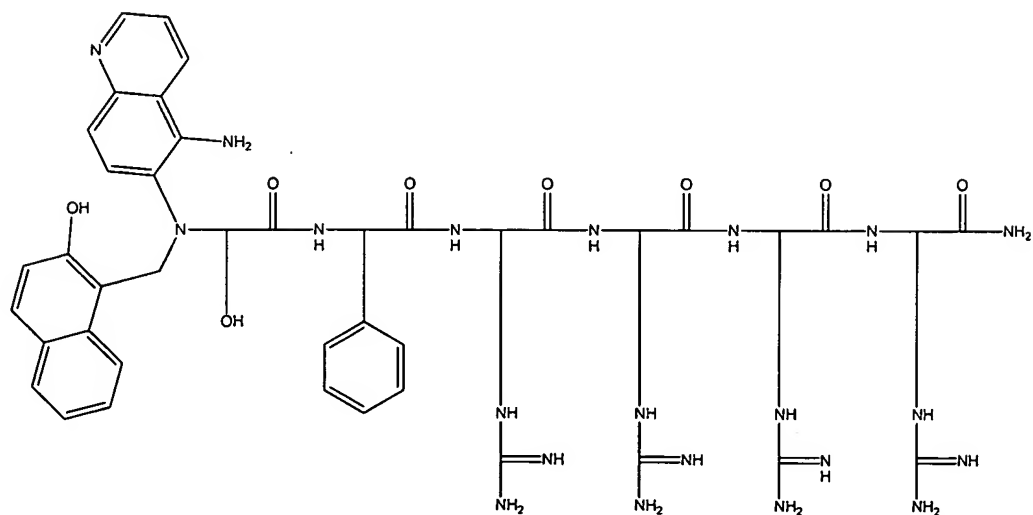


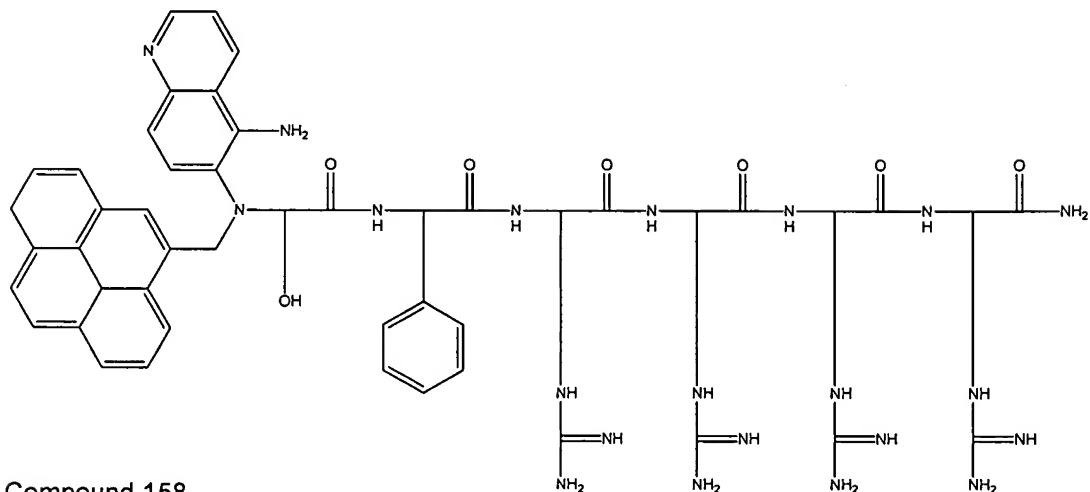
Compound 155



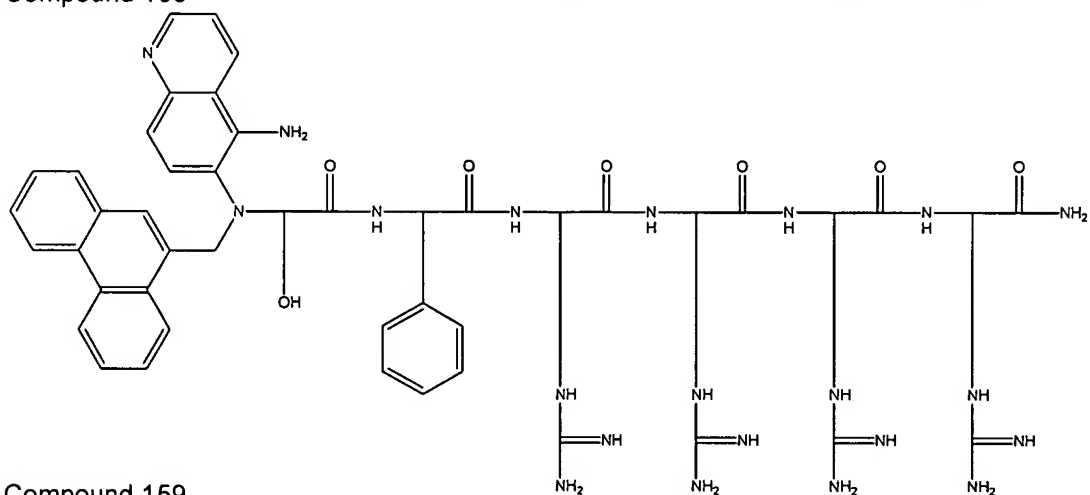
Compound 156

Compound 157

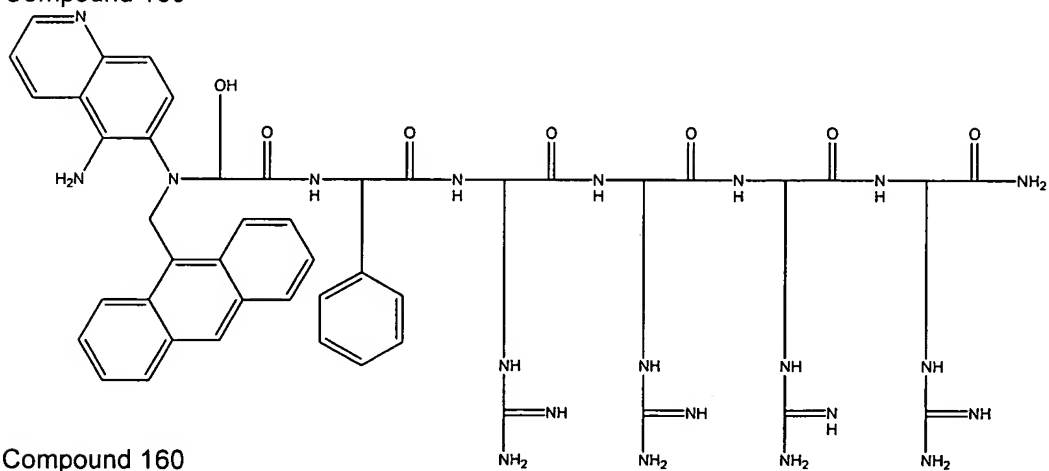




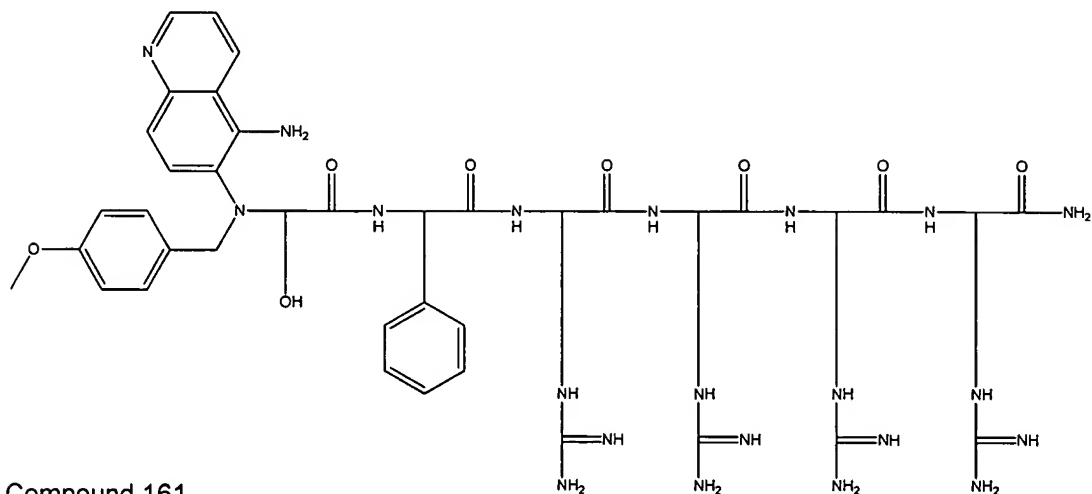
Compound 158



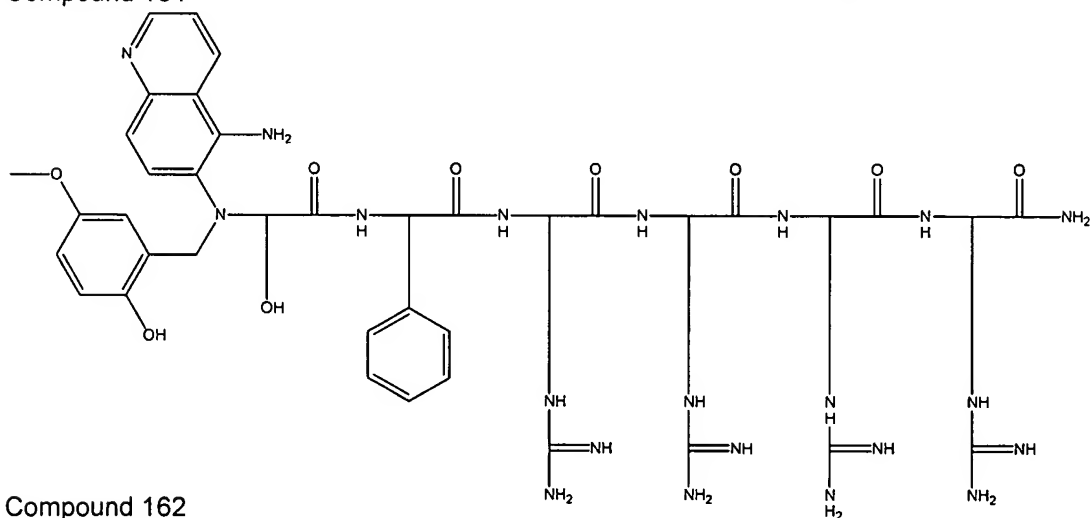
Compound 159



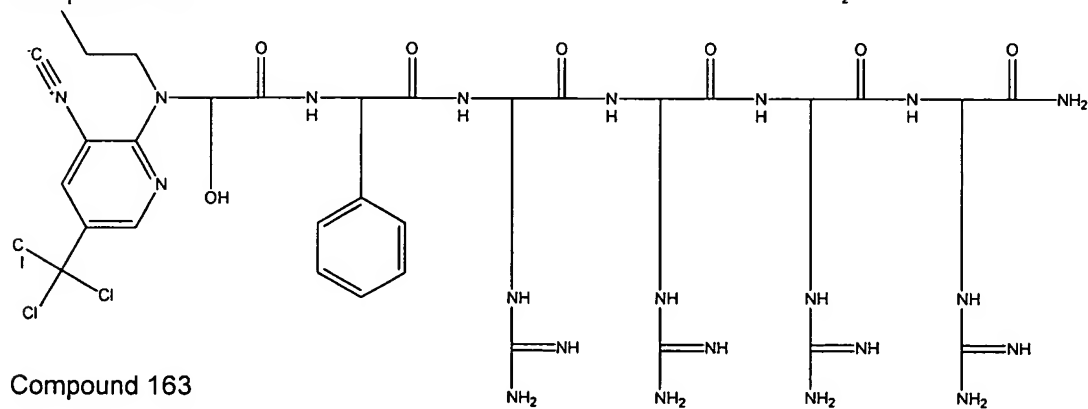
Compound 160



Compound 161



Compound 162



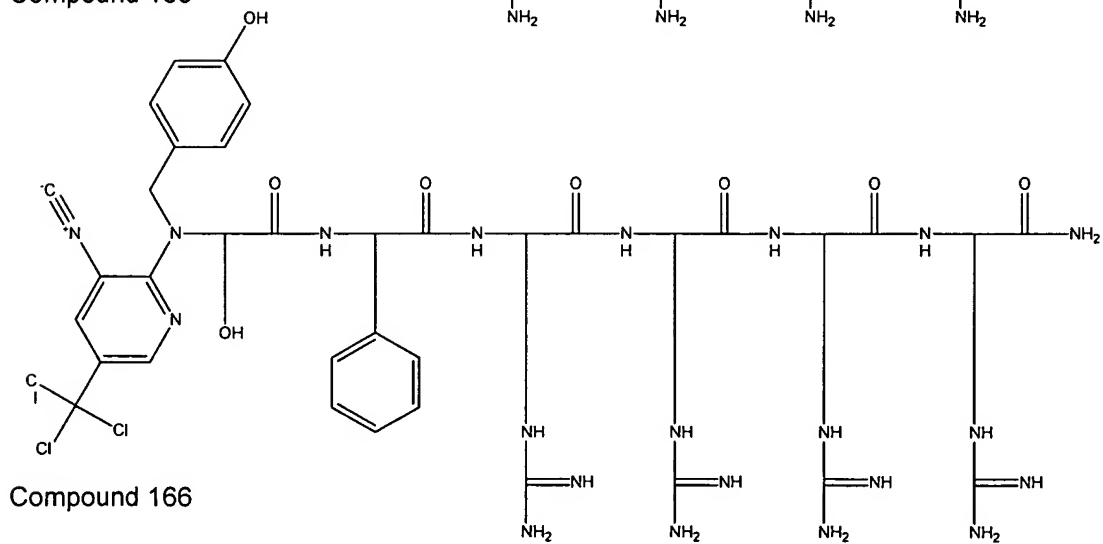
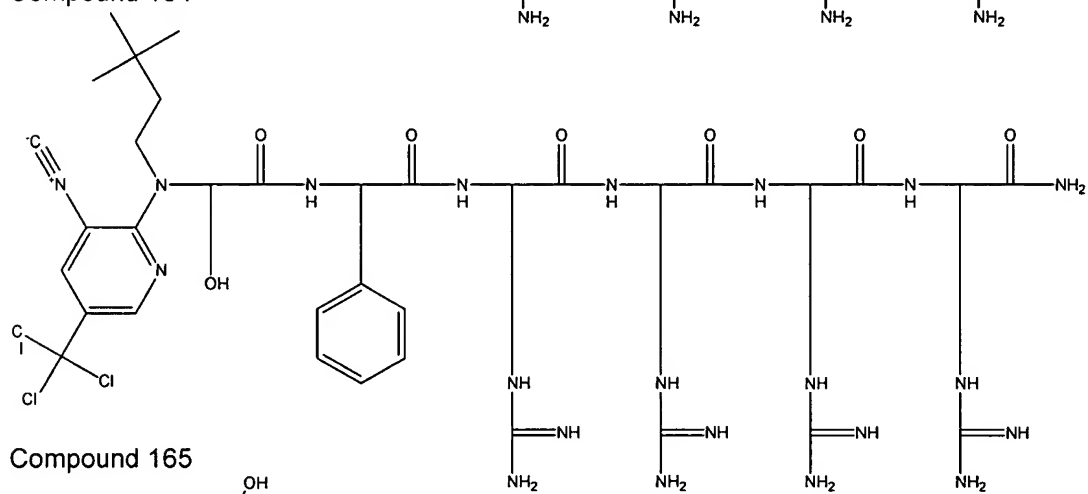
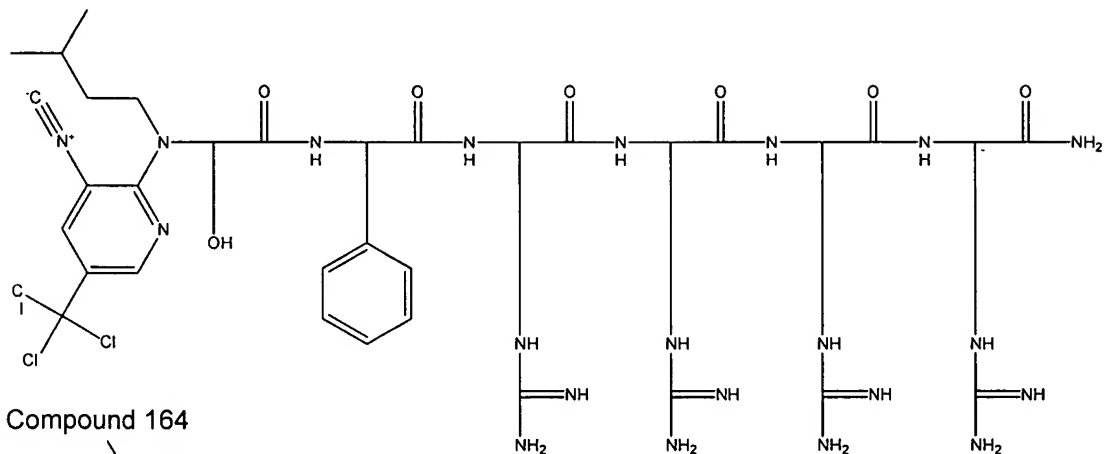
Compound 163

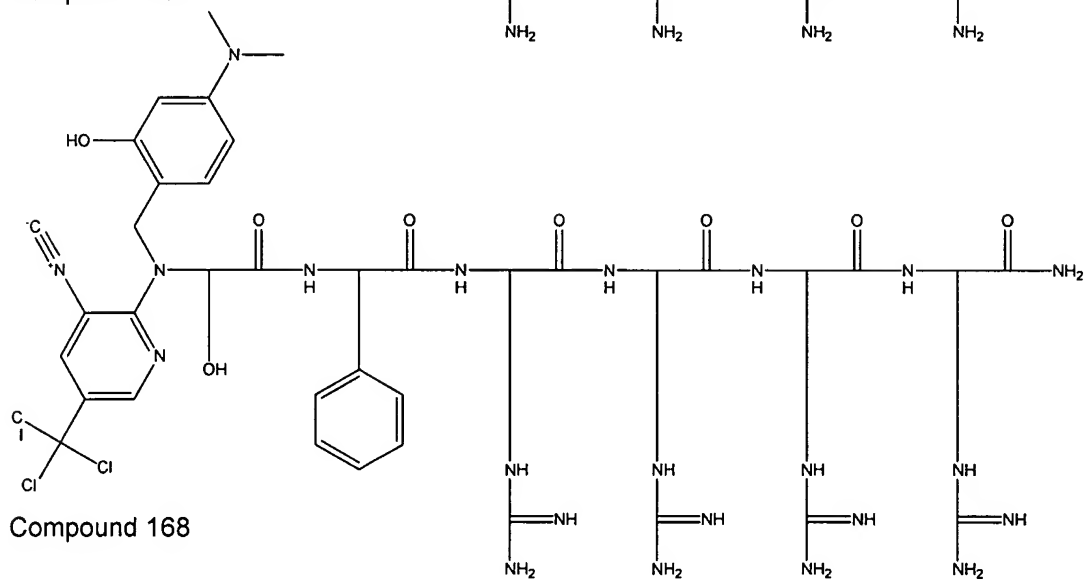
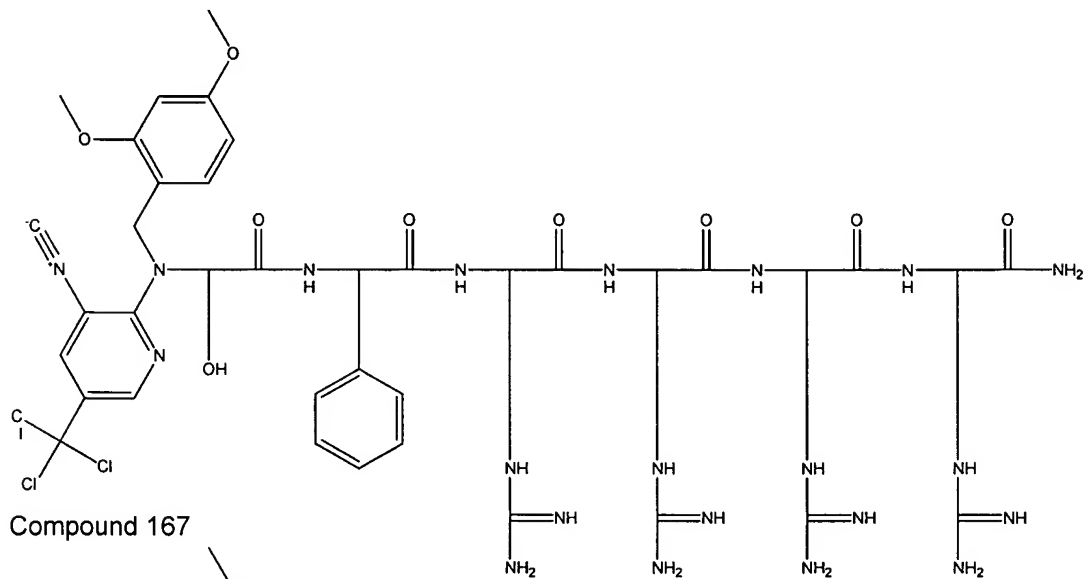
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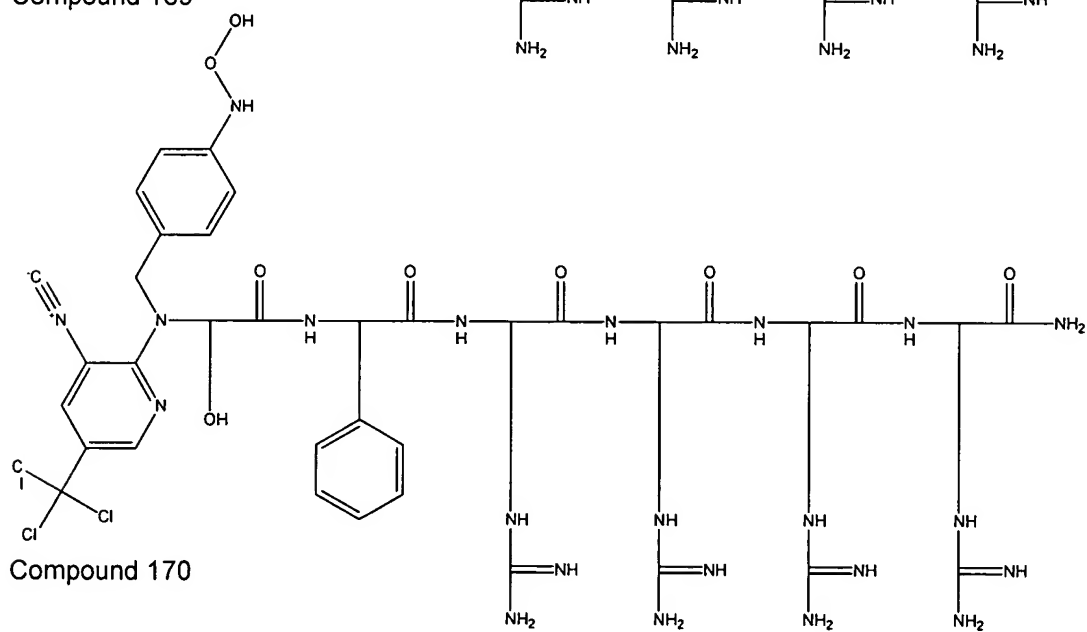
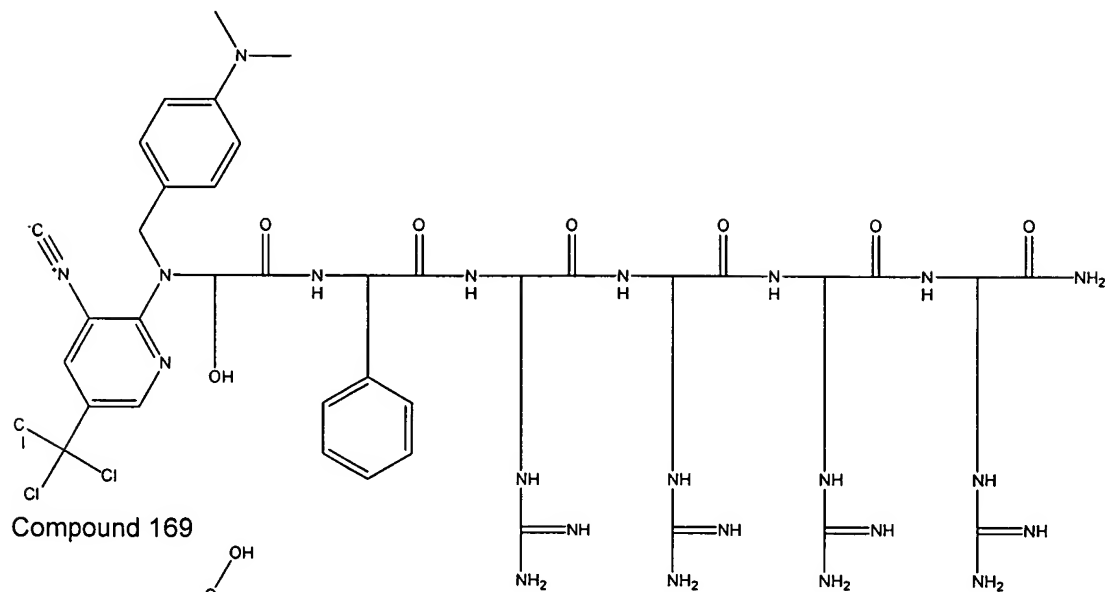
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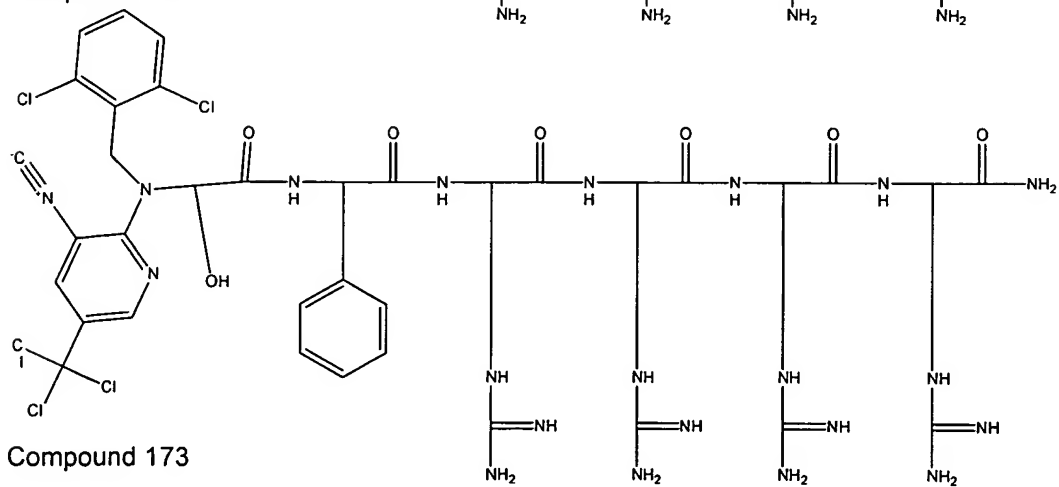
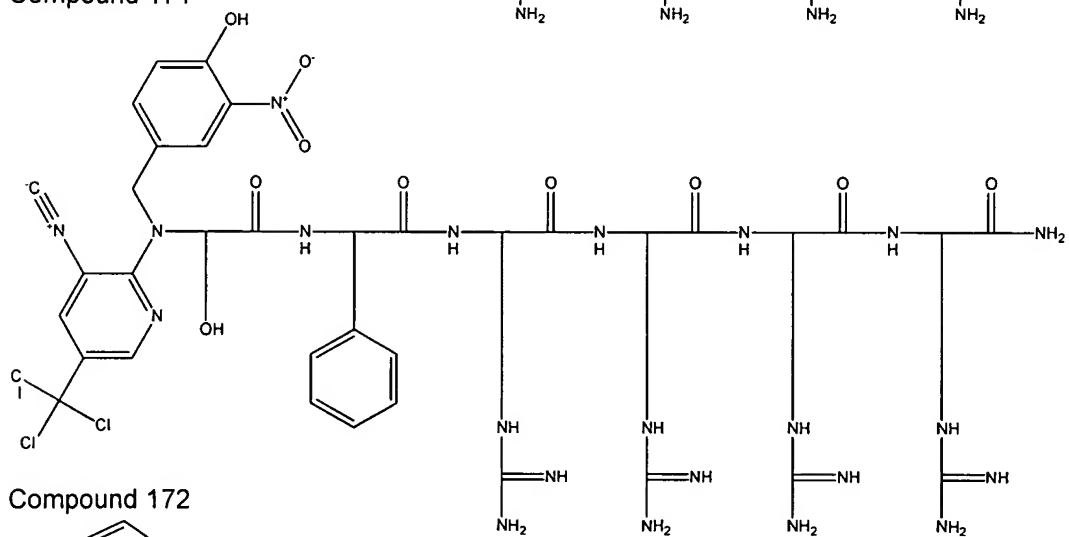
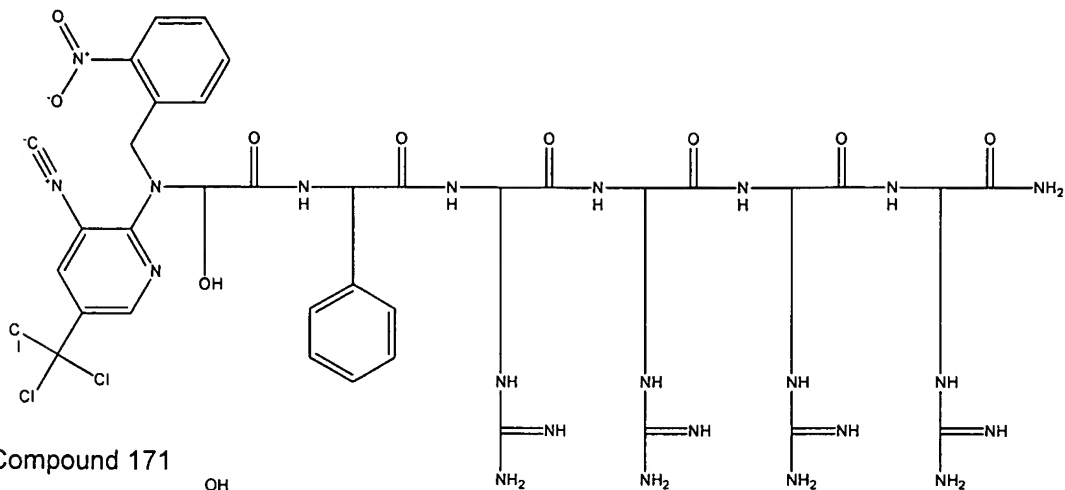
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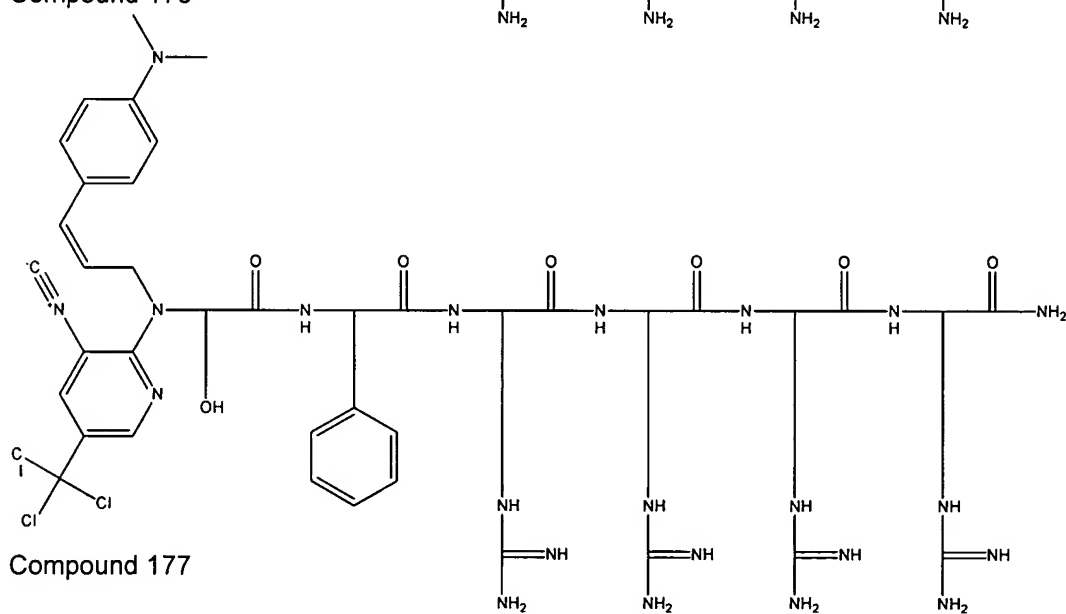
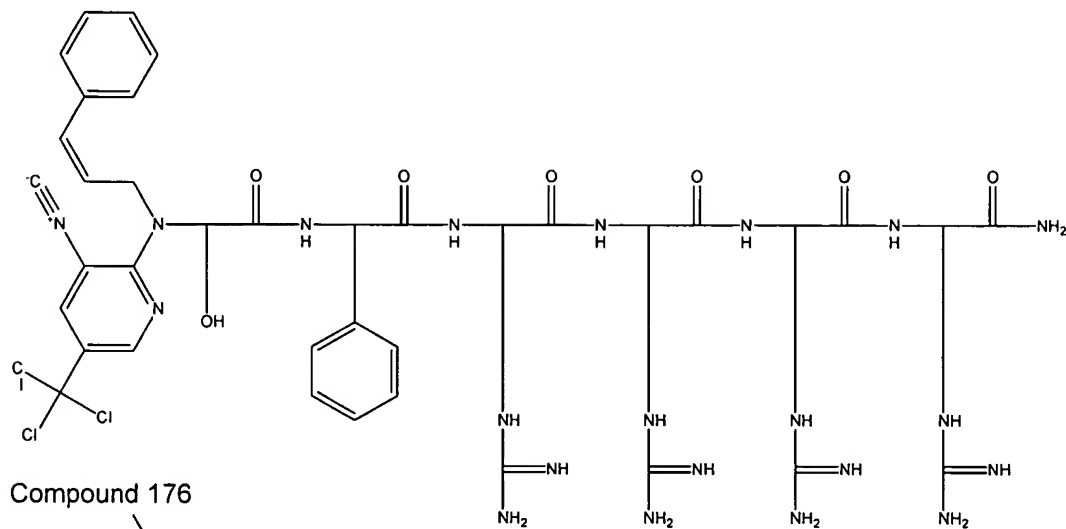


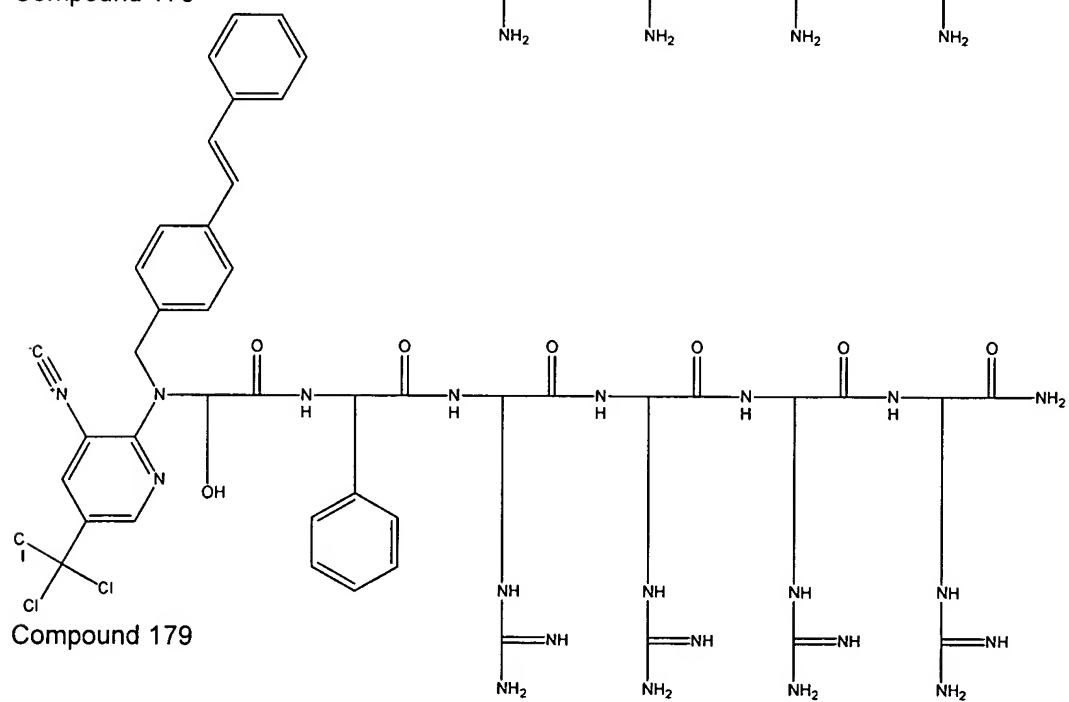
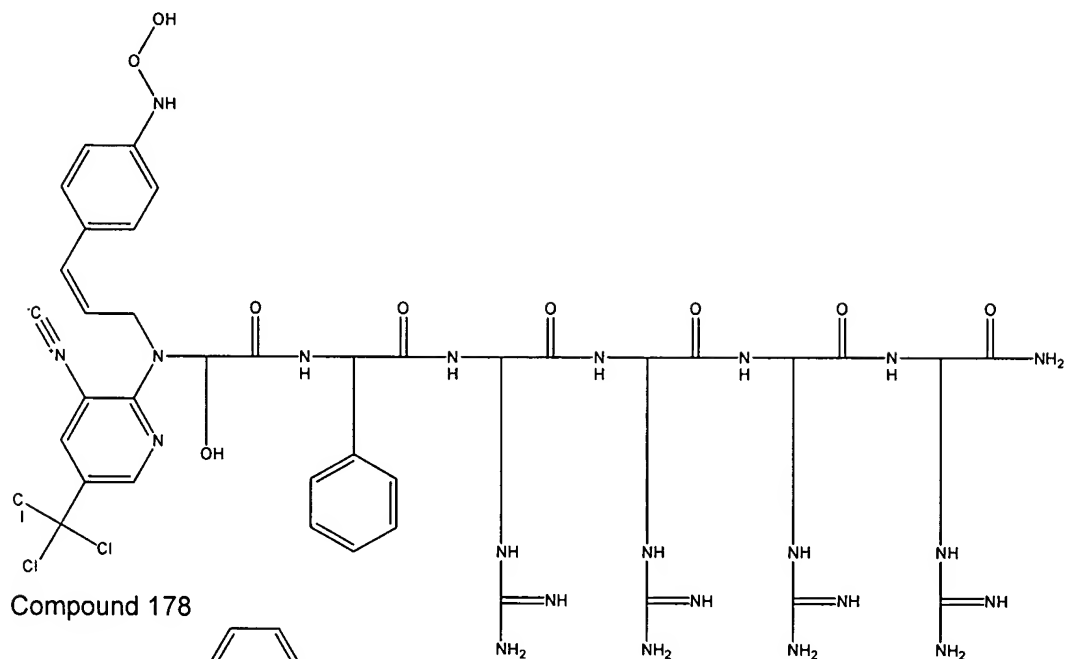


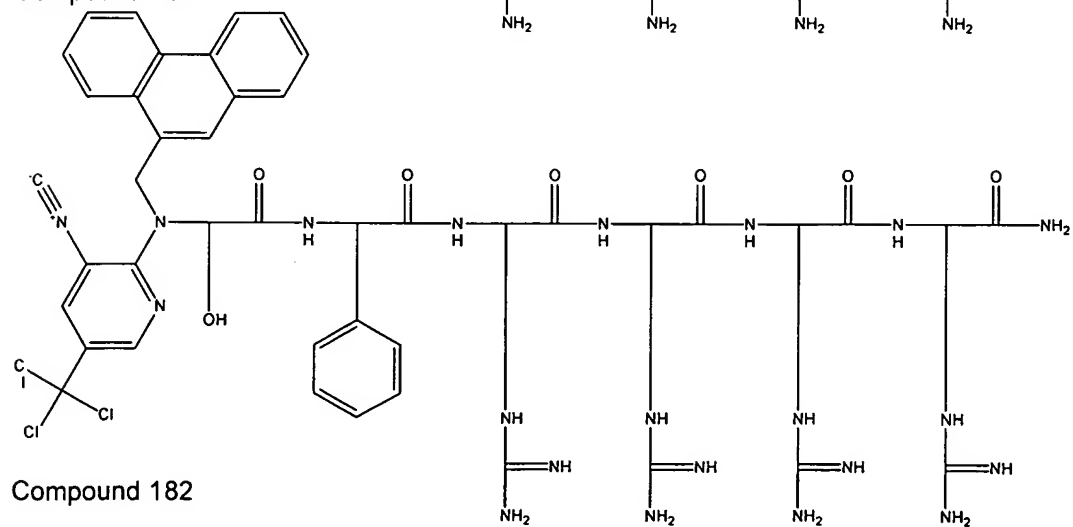
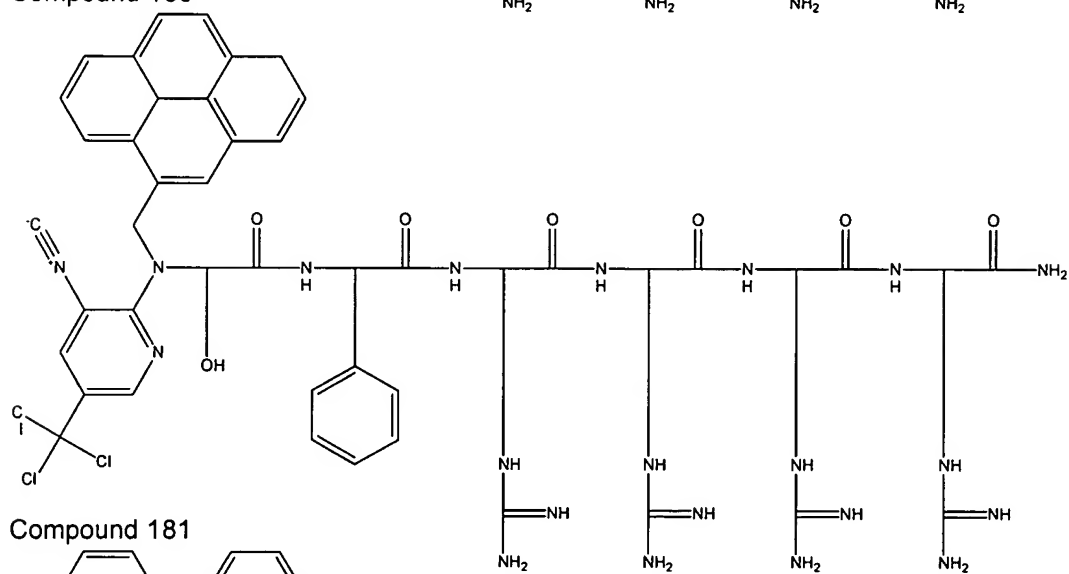
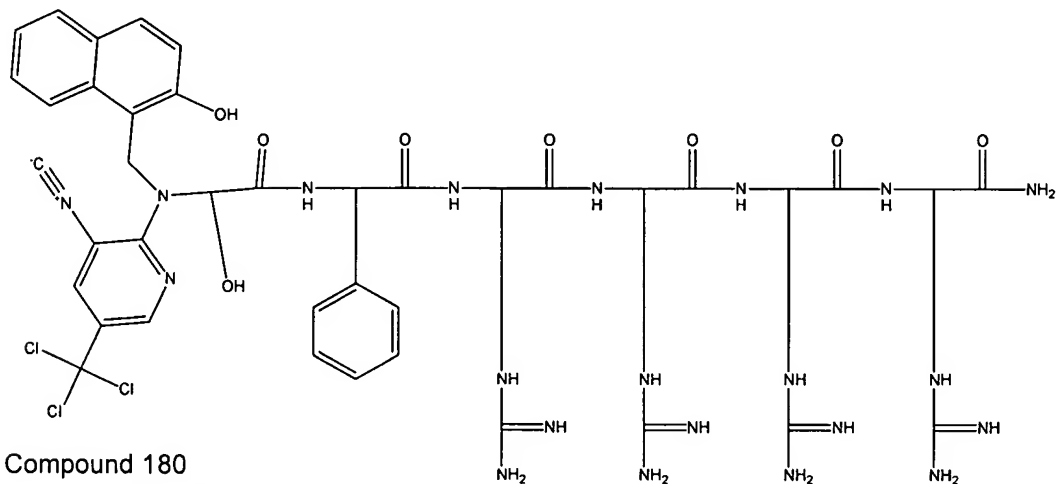


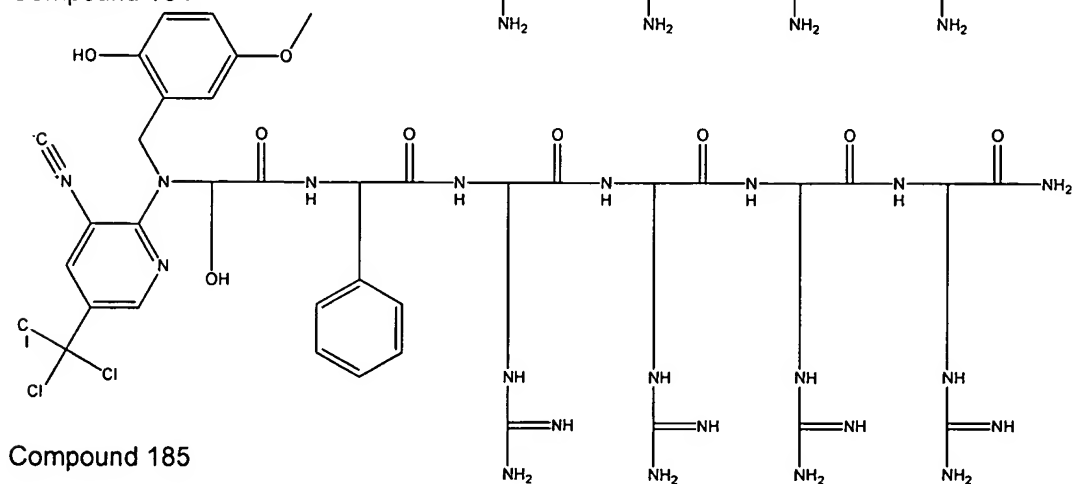
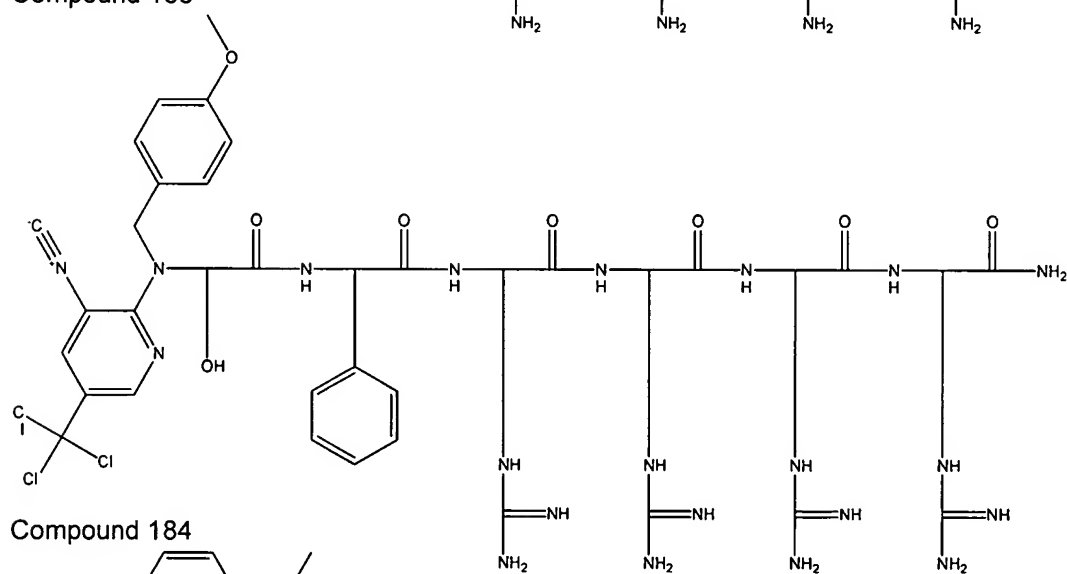
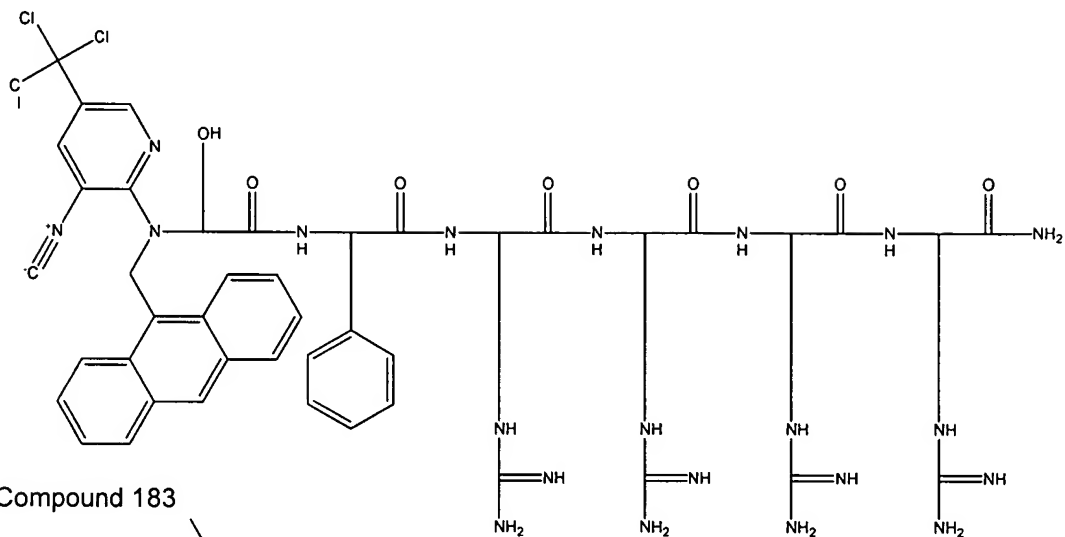
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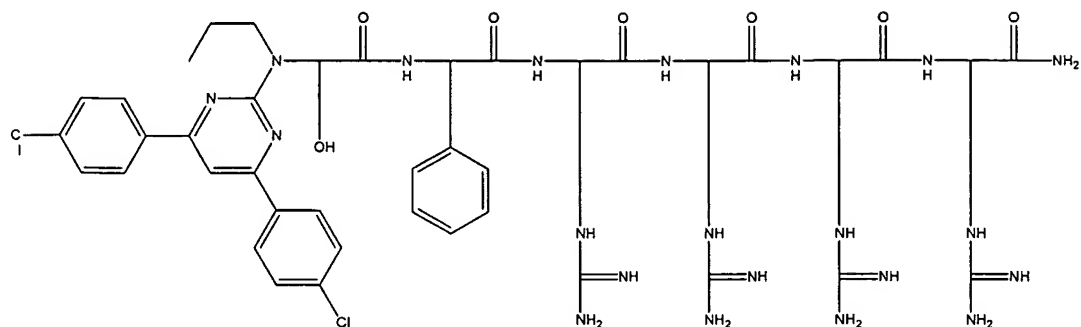






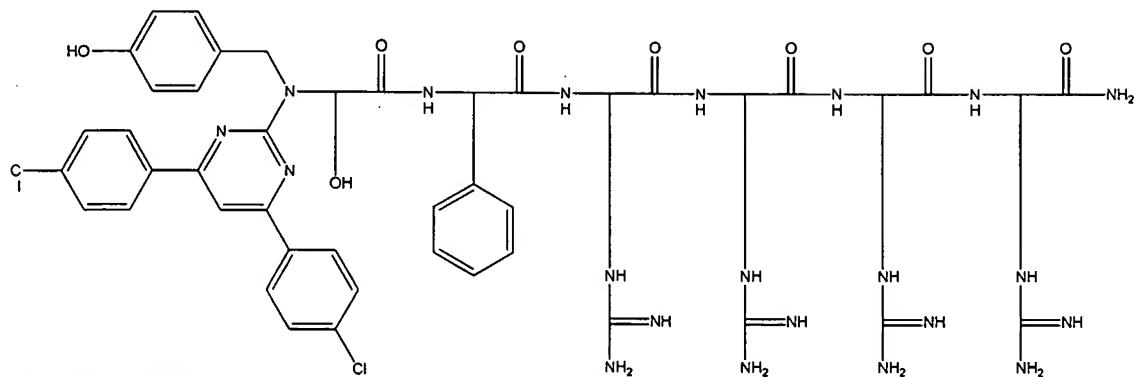


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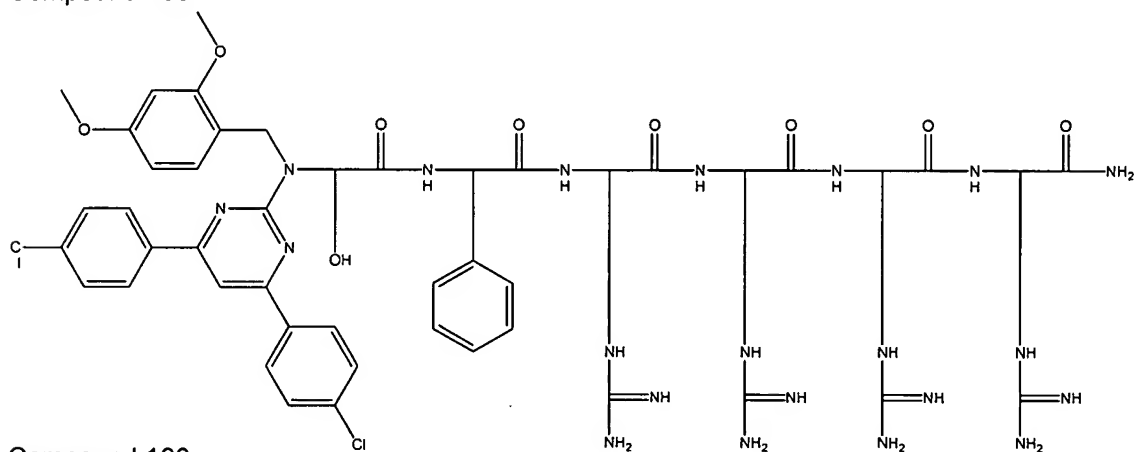
CC(C)CCN(C(=O)N(C(=O)N(C(=O)N(C(=O)N(C(=O)N(C(=O)N)N)N)N)N)N)C1=NC=C(C2=CC=CC=C2Cl)N=C(N1)C3=CC=CC=C3ClCC(C)(C)CN(C(=O)NC(=O)NC(=O)NC(=O)NC(=O)NC(=O)N)C1=NC2=CC=C(Cl)C=C2N=C1C3=CC=C(Cl)C=C3

### Compound 188

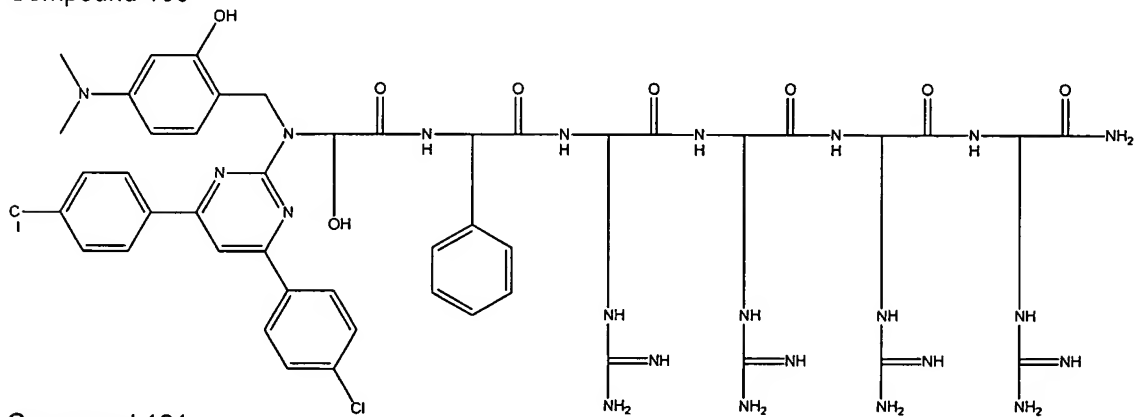




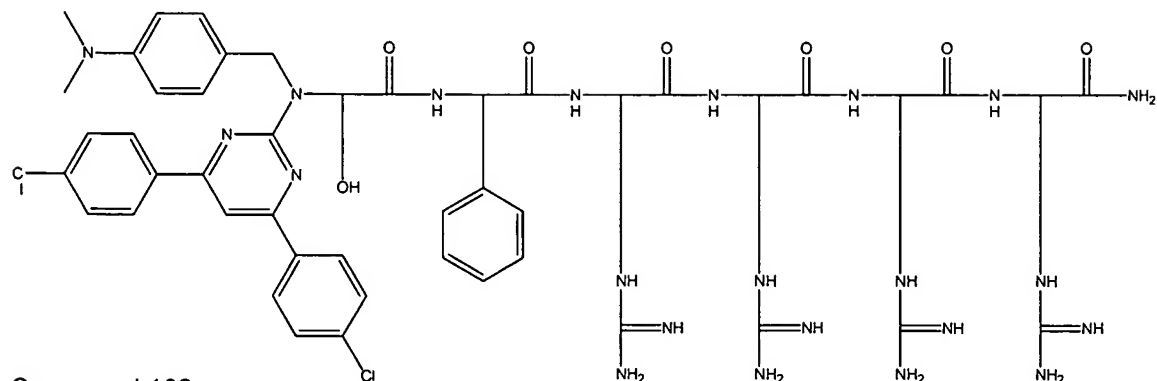
Compound 189



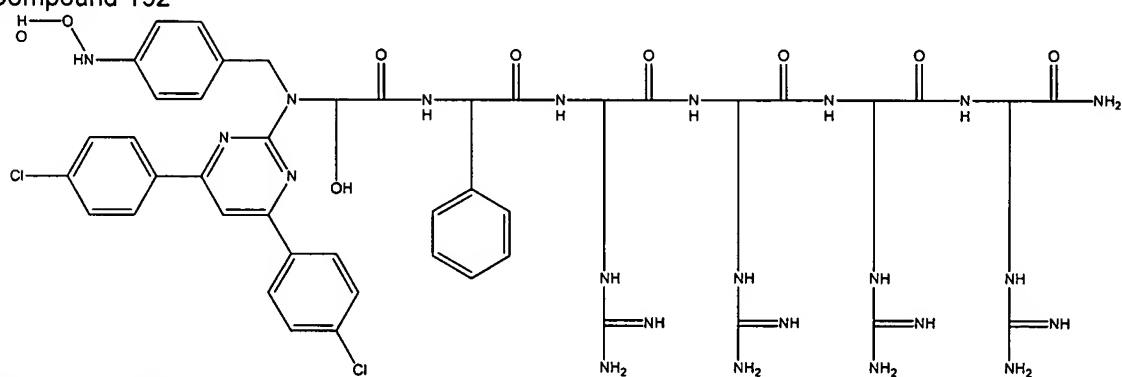
Compound 190



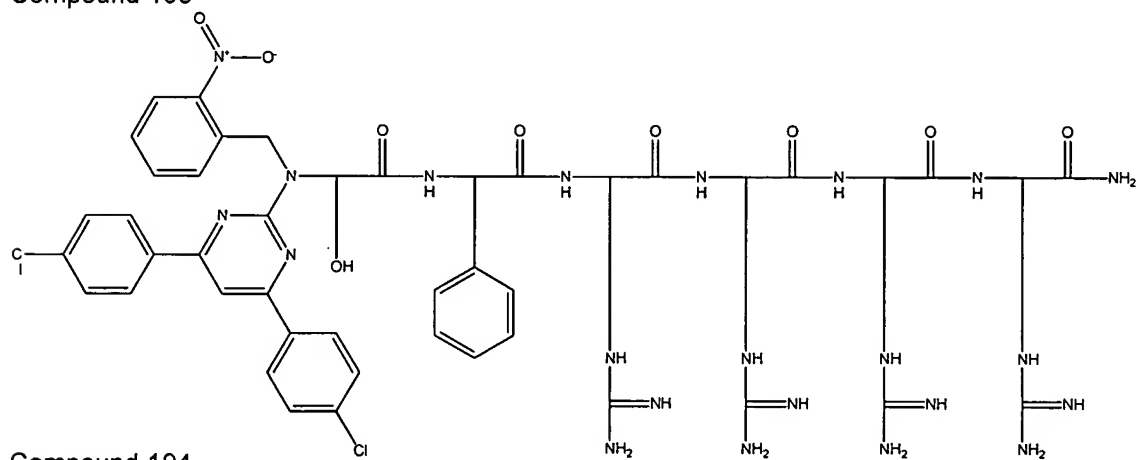
Compound 191



Compound 192

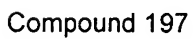


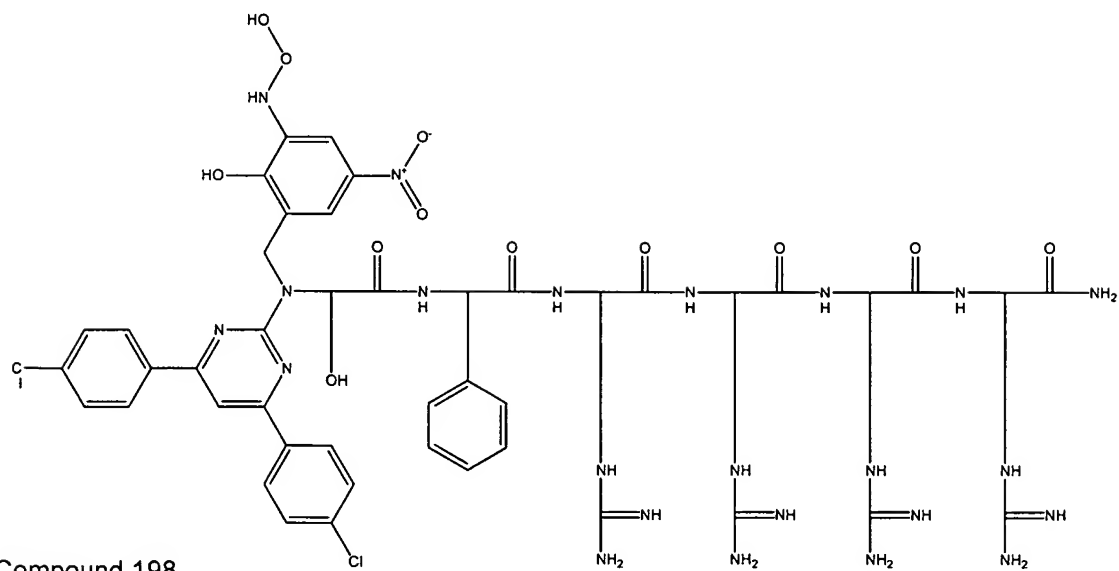
Compound 193



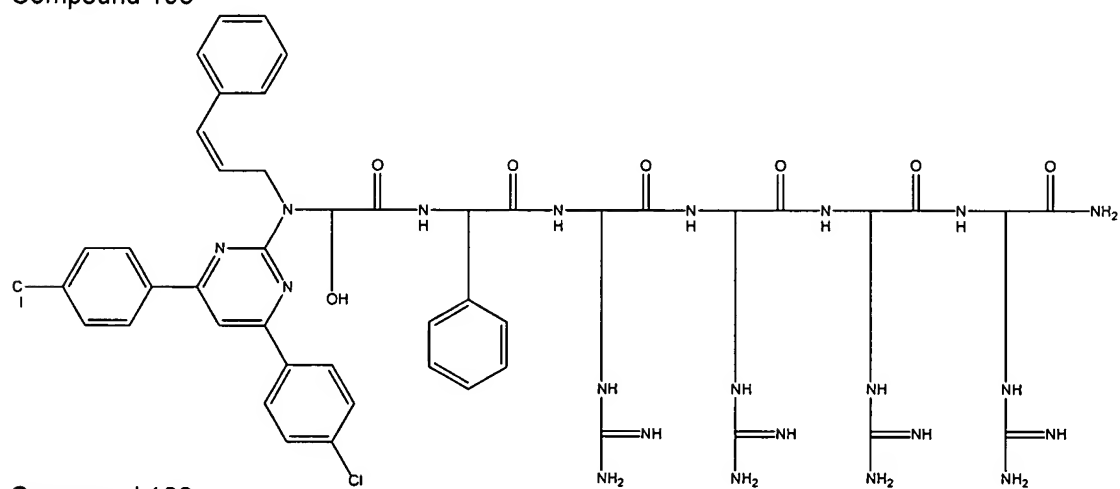
Compound 194

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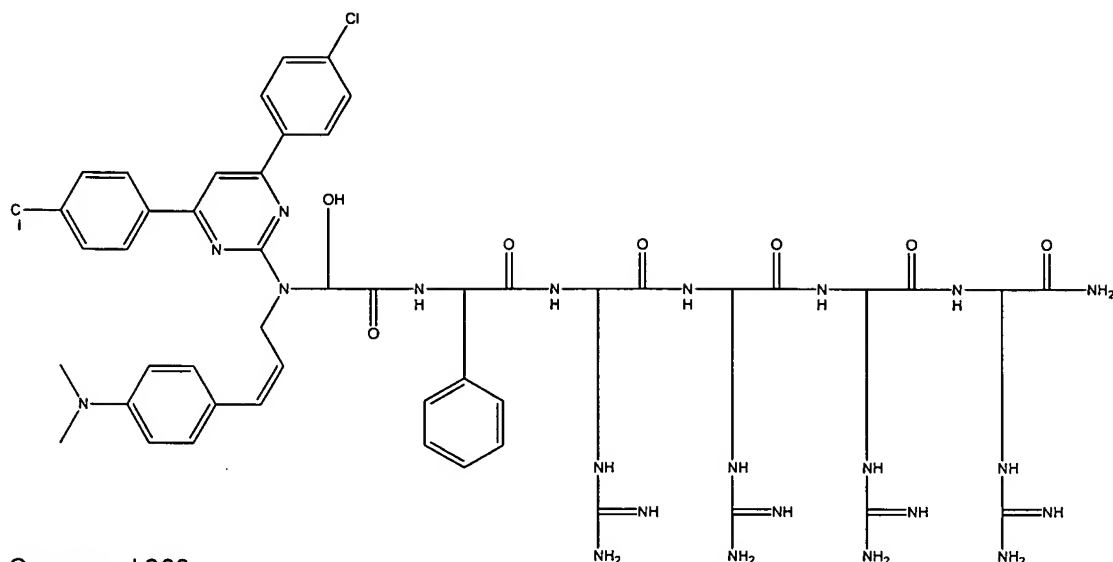


Compound 198

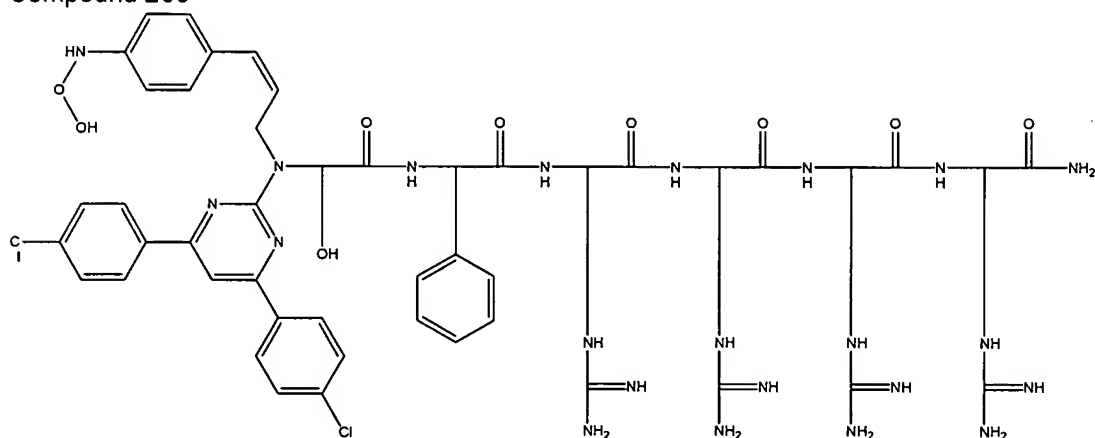


Compound 199

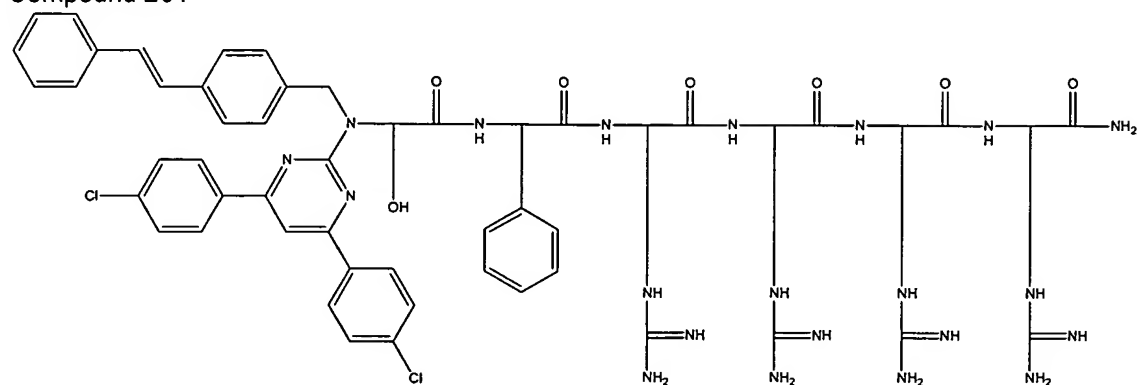
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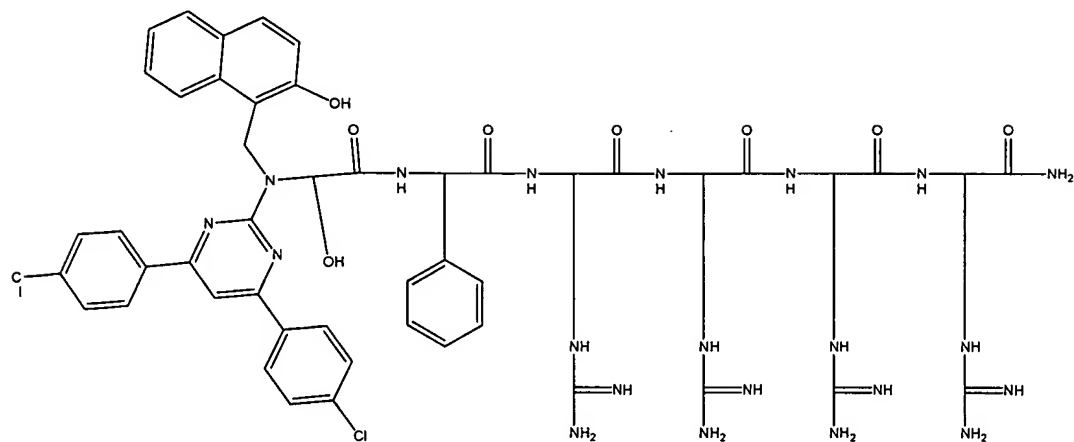
Compound 200



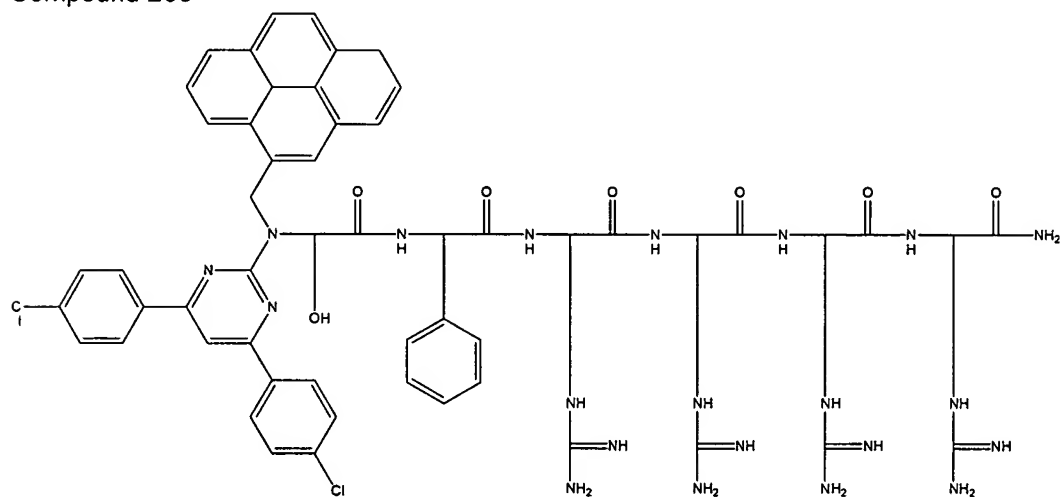
### Compound 201



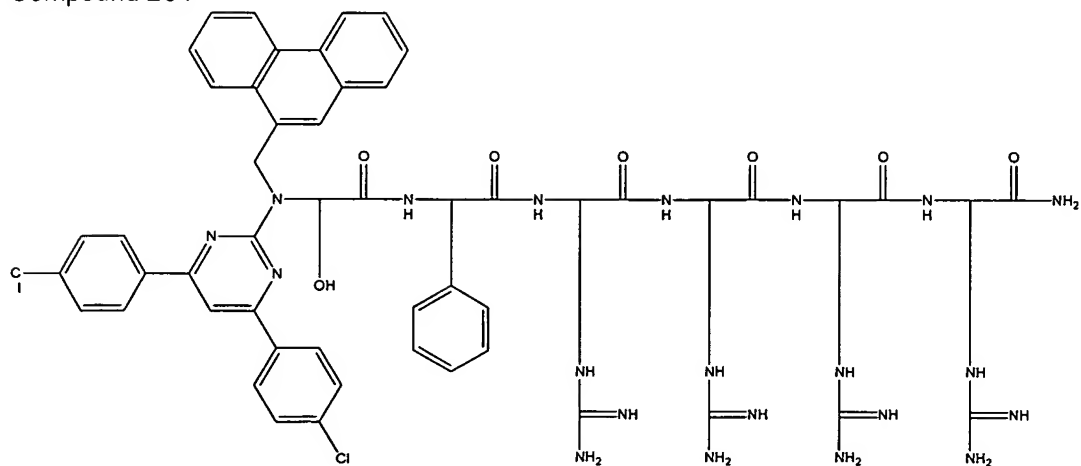
### Compound 202



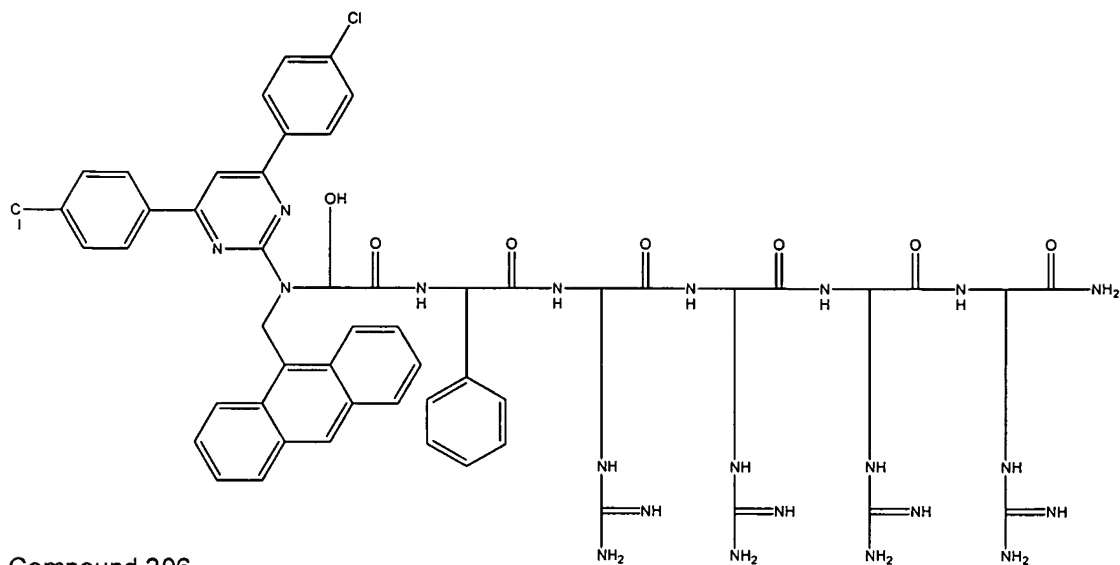
Compound 203



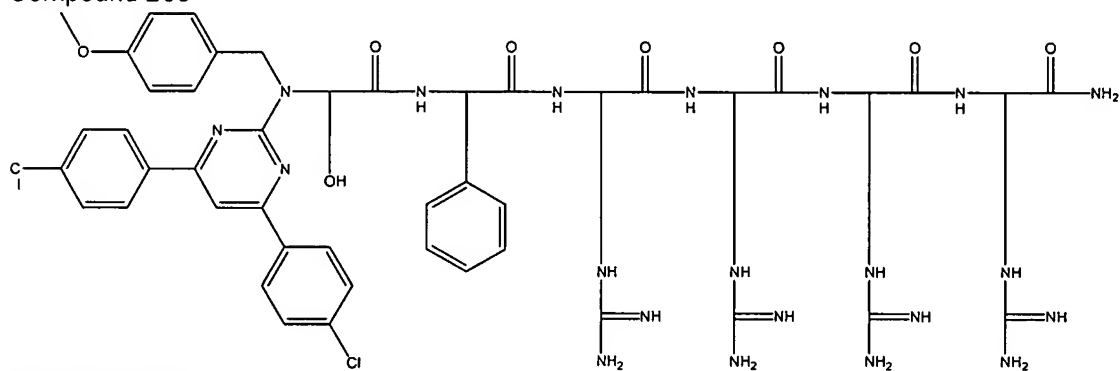
Compound 204



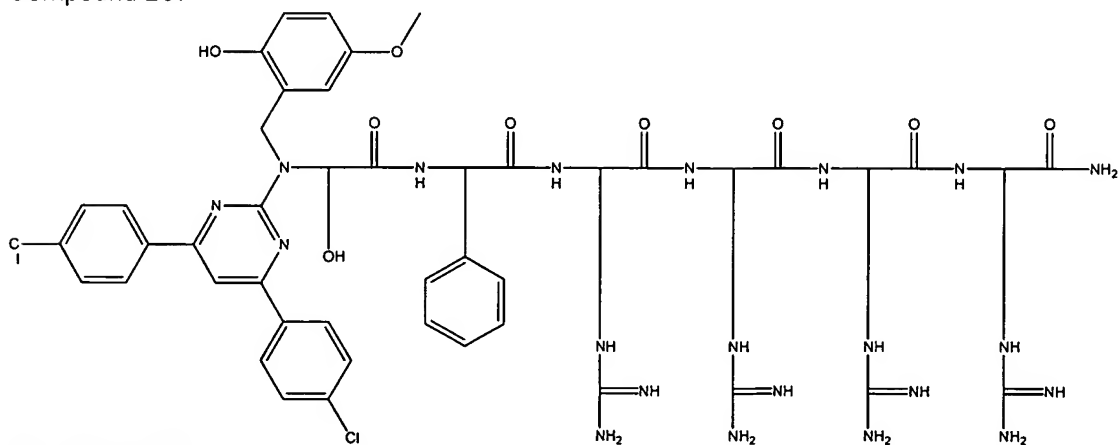
Compound 205



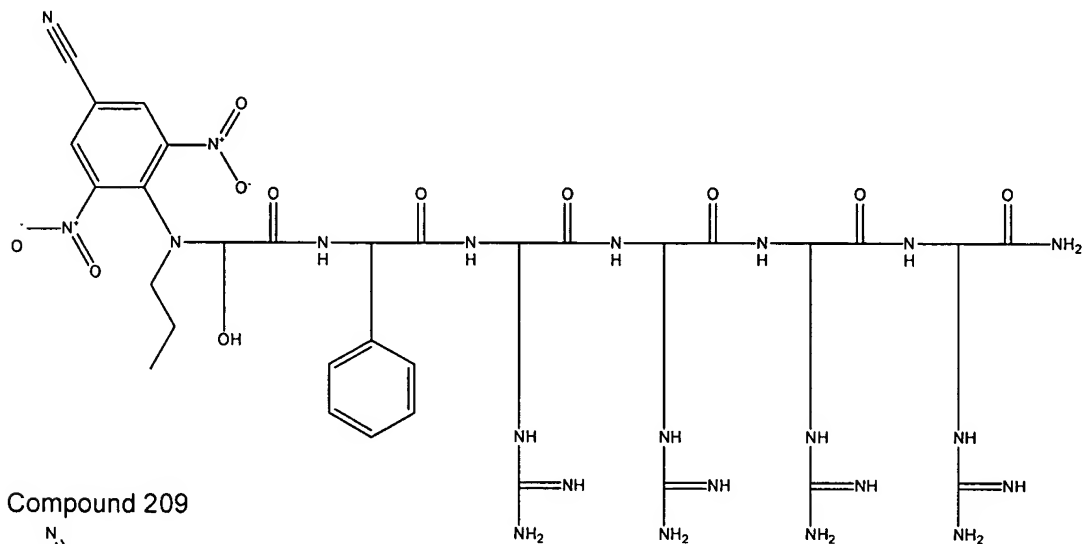
Compound 206



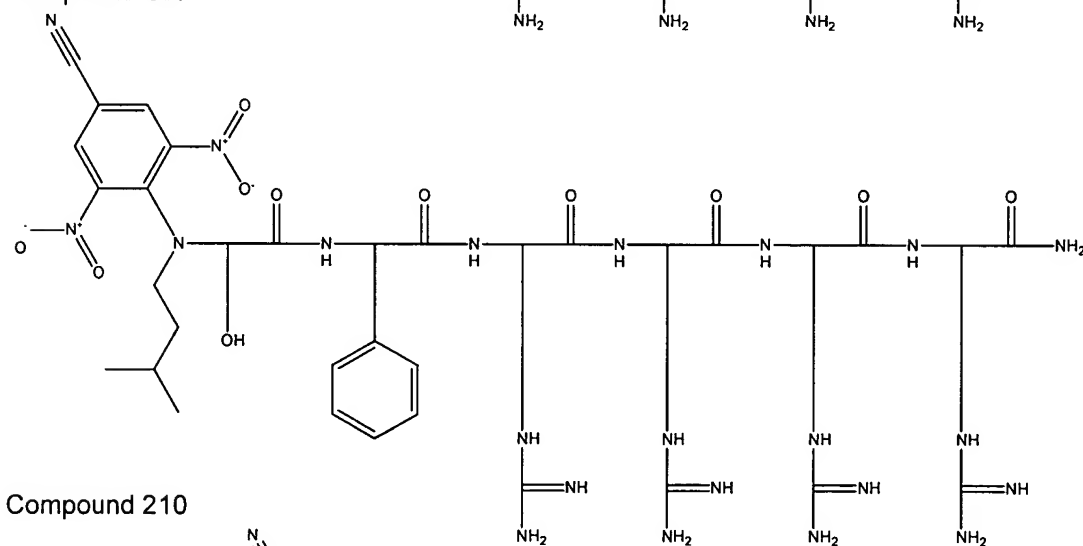
Compound 207



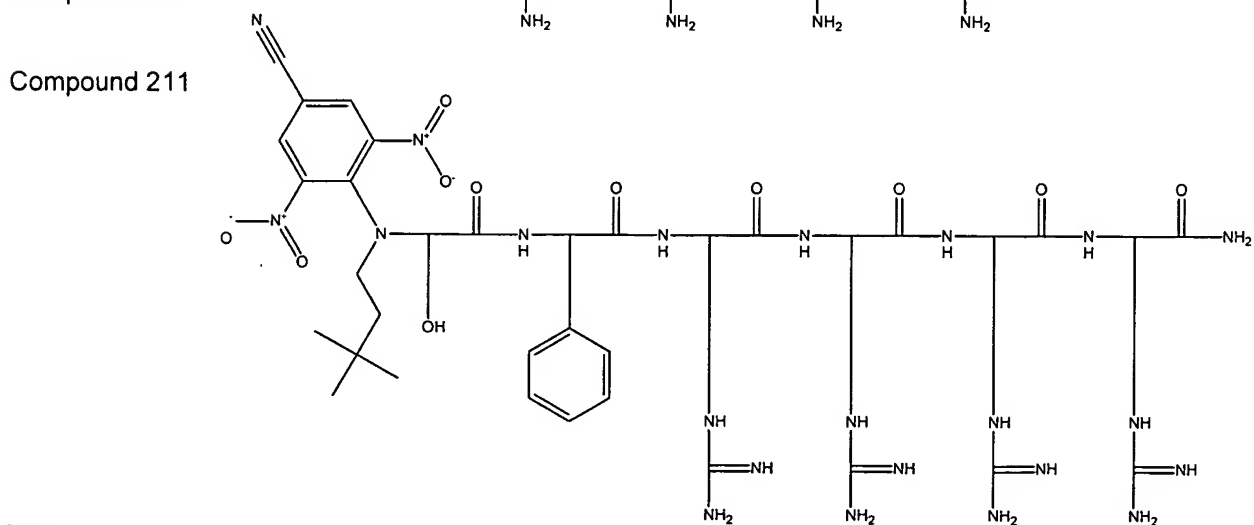
Compound 208



Compound 209

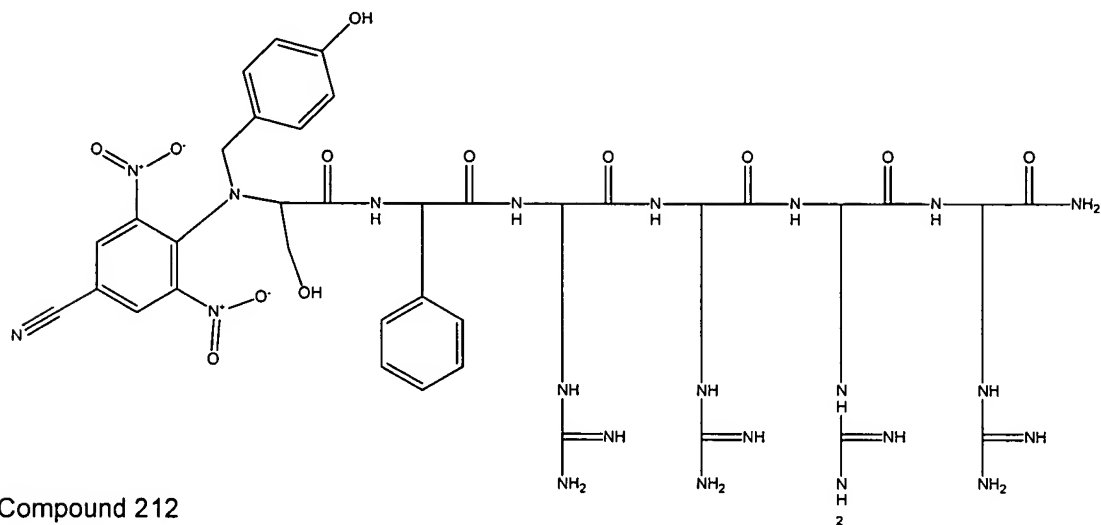


Compound 210

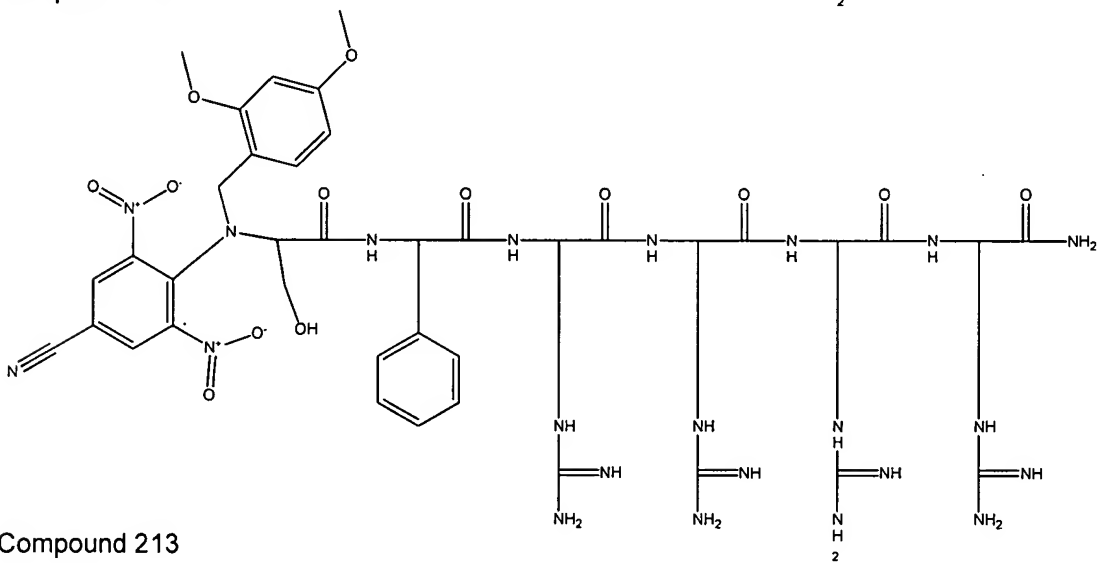


Compound 211





Compound 212



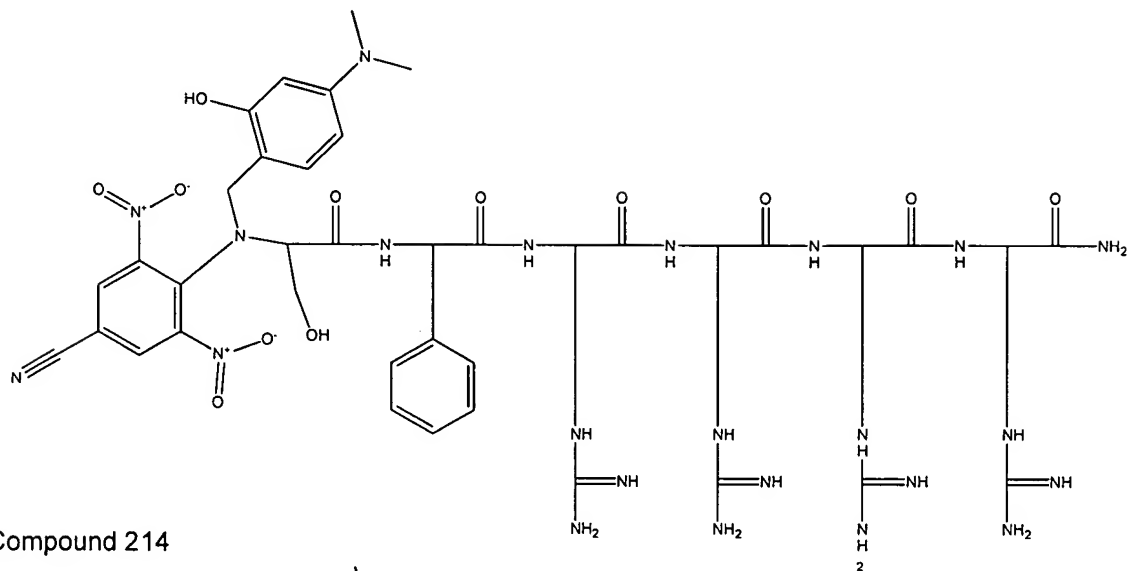
Compound 213

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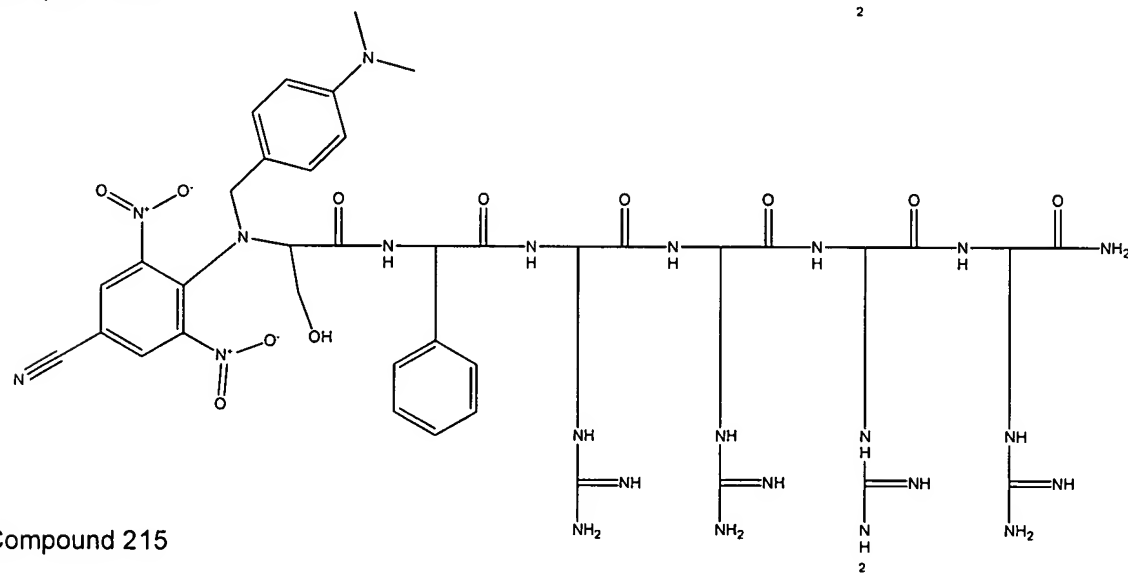
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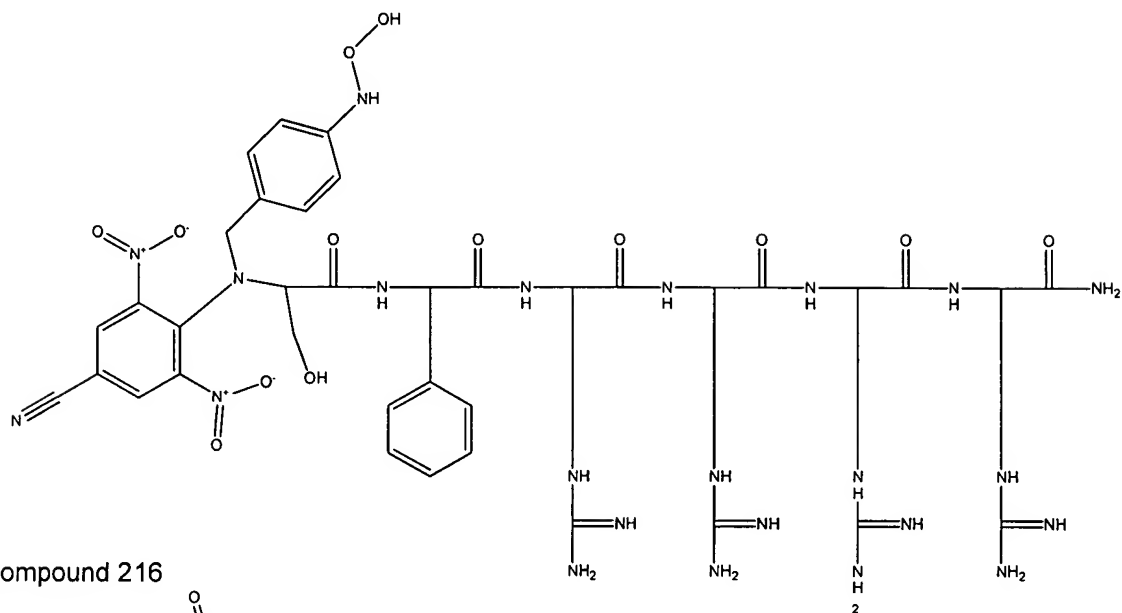


Compound 214

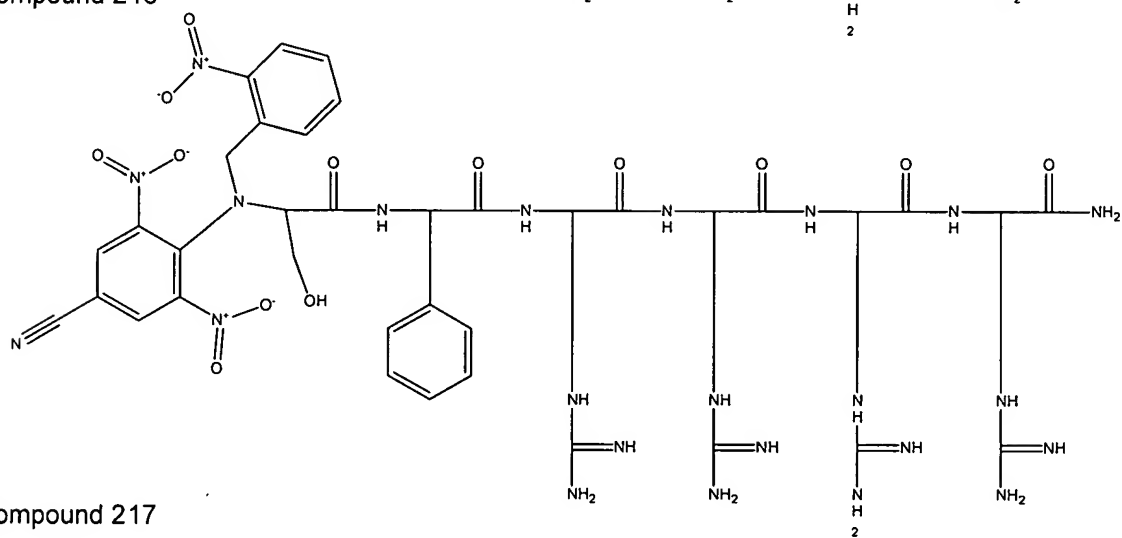


Compound 215

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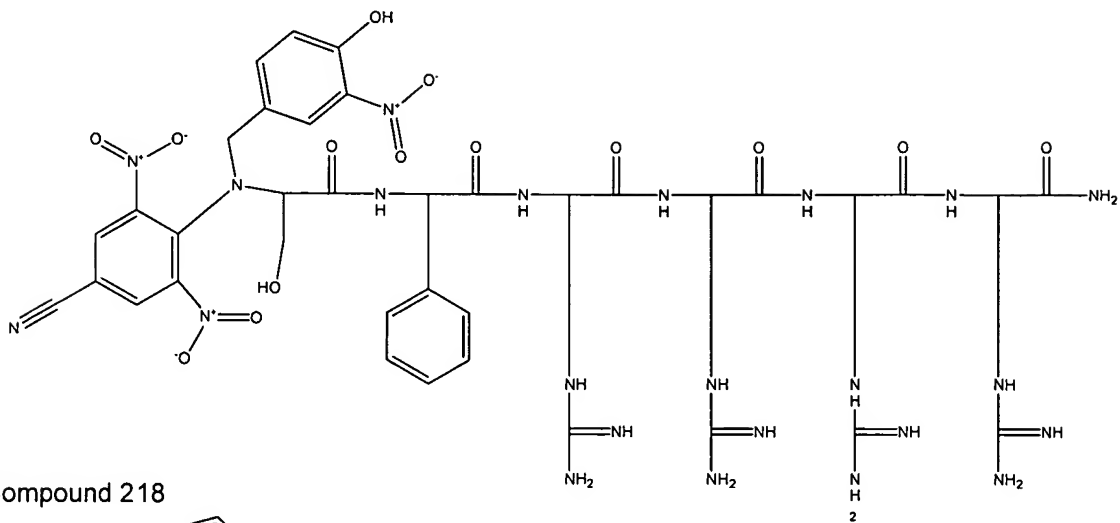


Compound 216

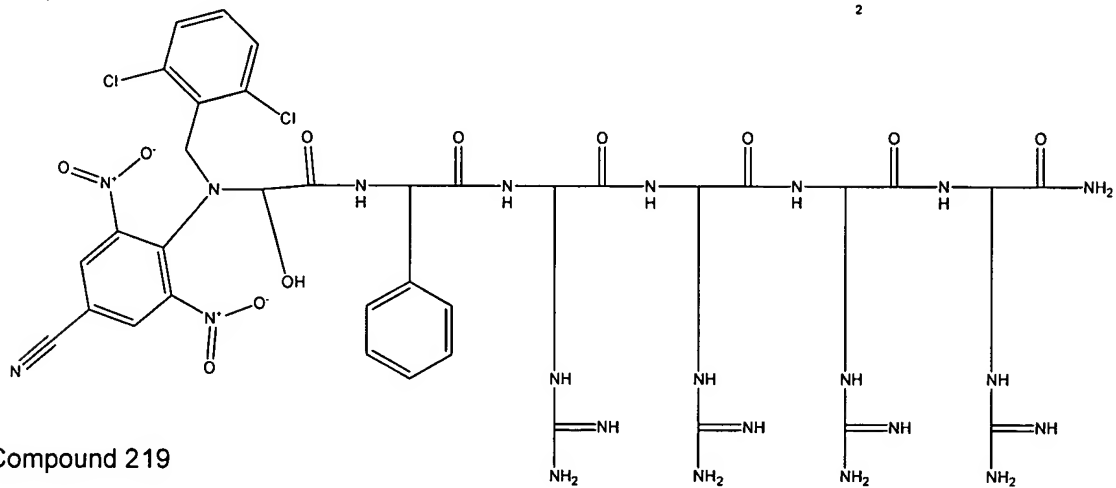


Compound 217

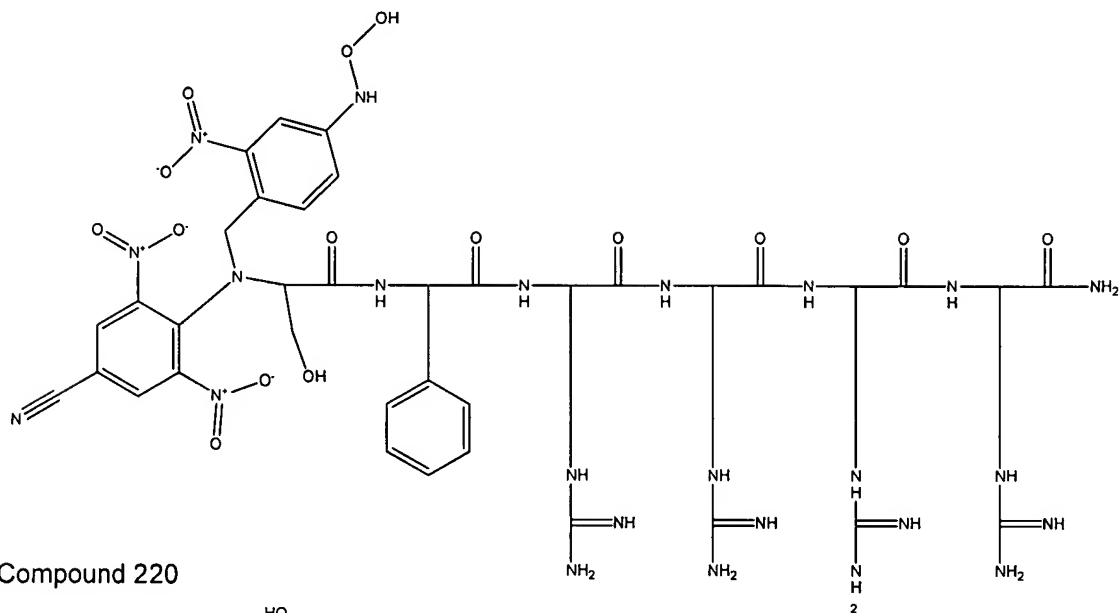
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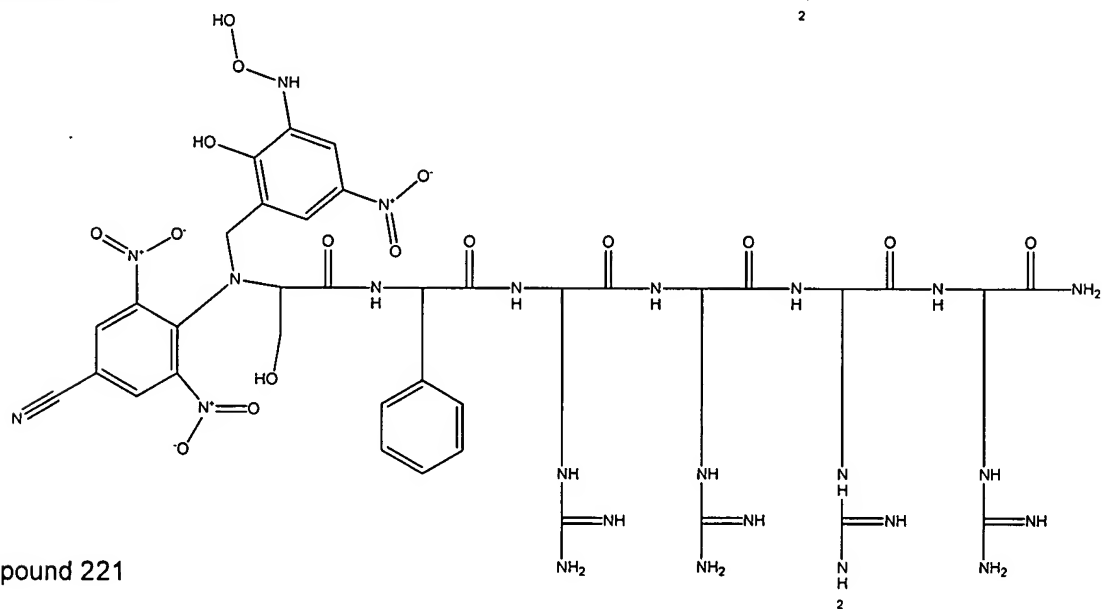
### Compound 218



### Compound 219



Compound 220



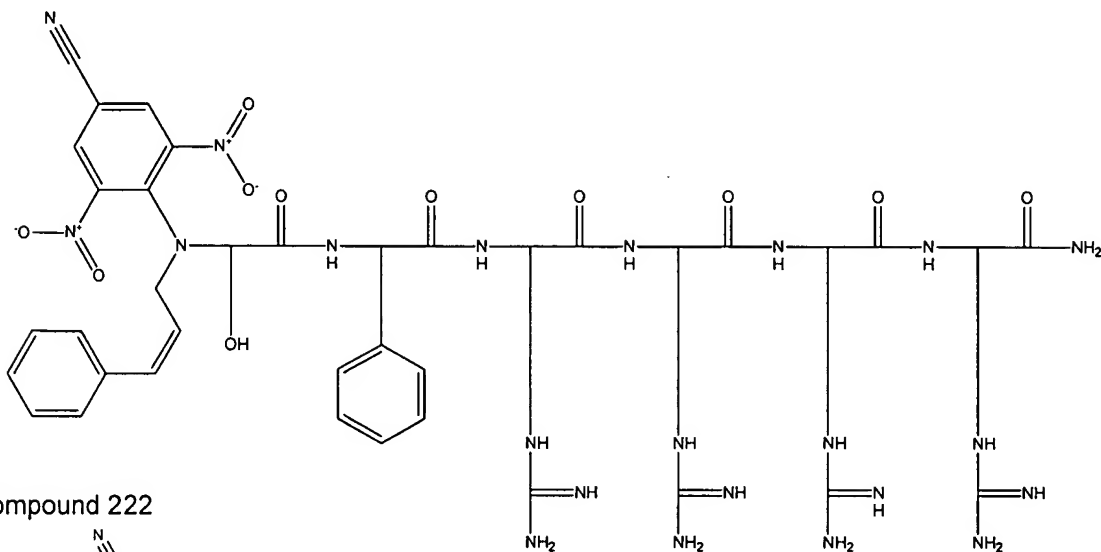
Compound 221

Applicant: David S. Lawrence

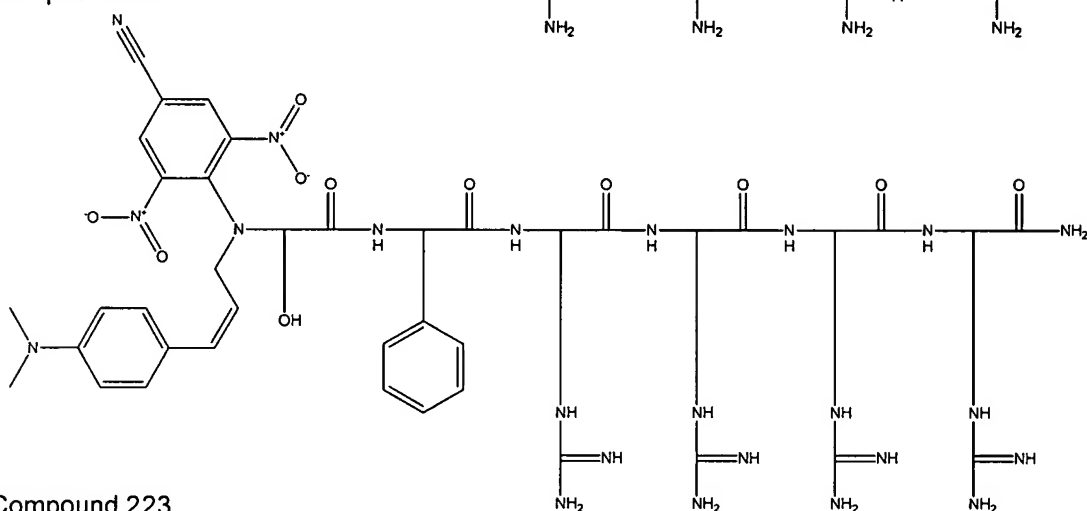
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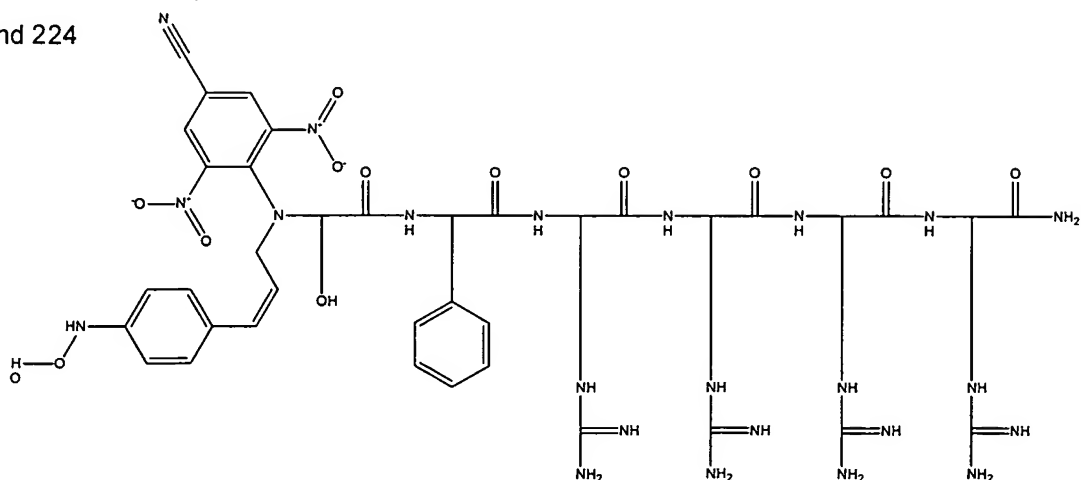


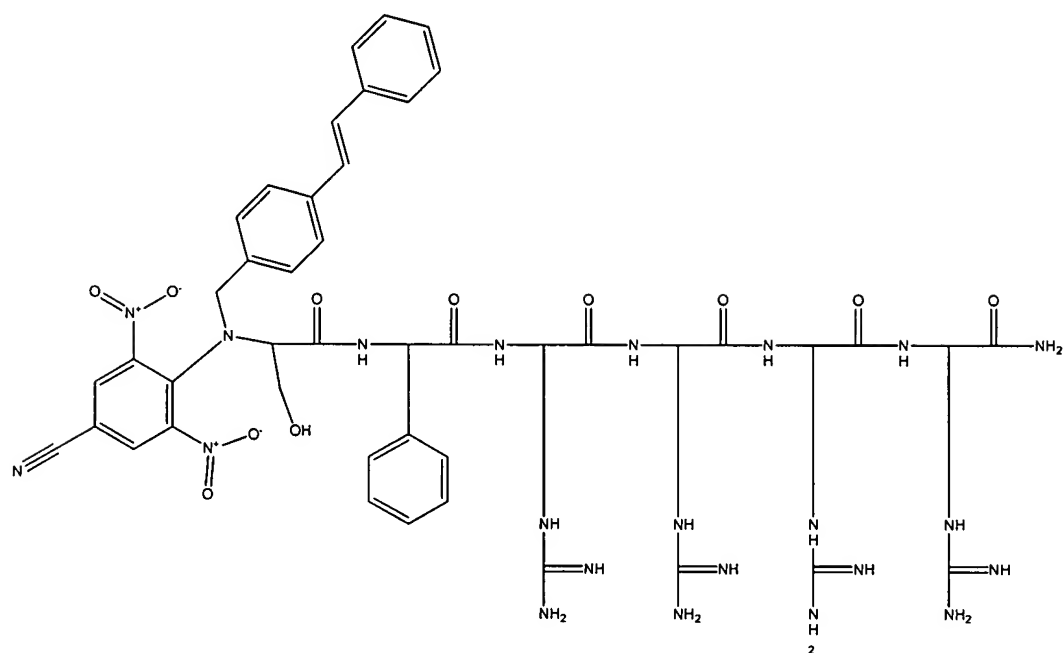
Compound 222



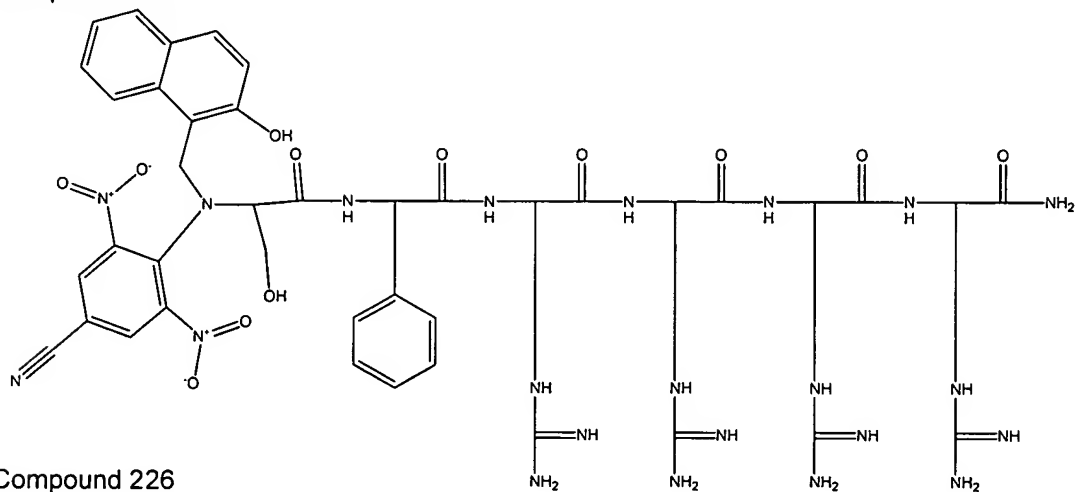
Compound 223

Compound 224



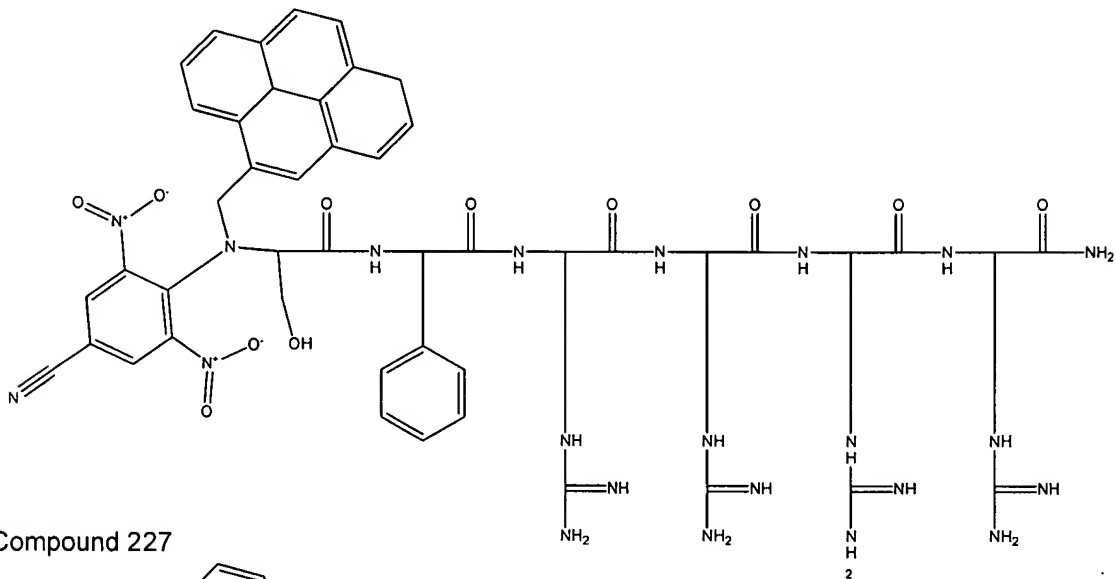


Compound 225

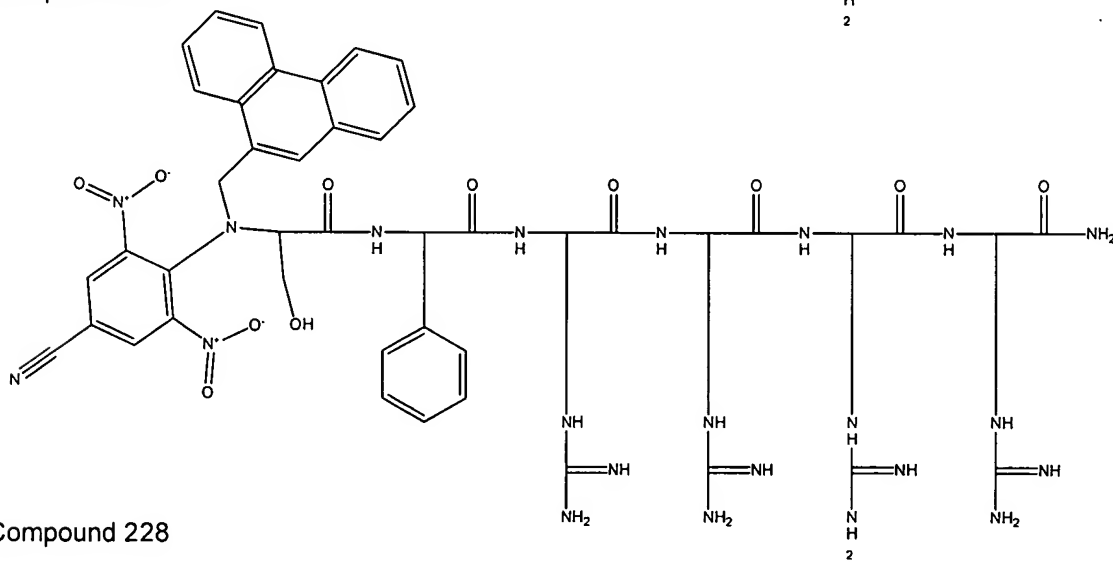


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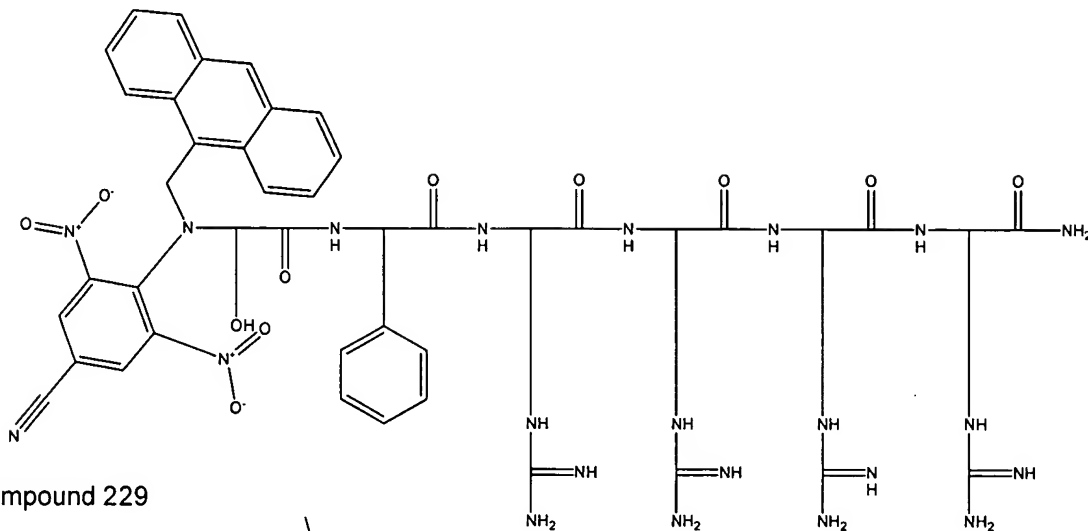
### Compound 227



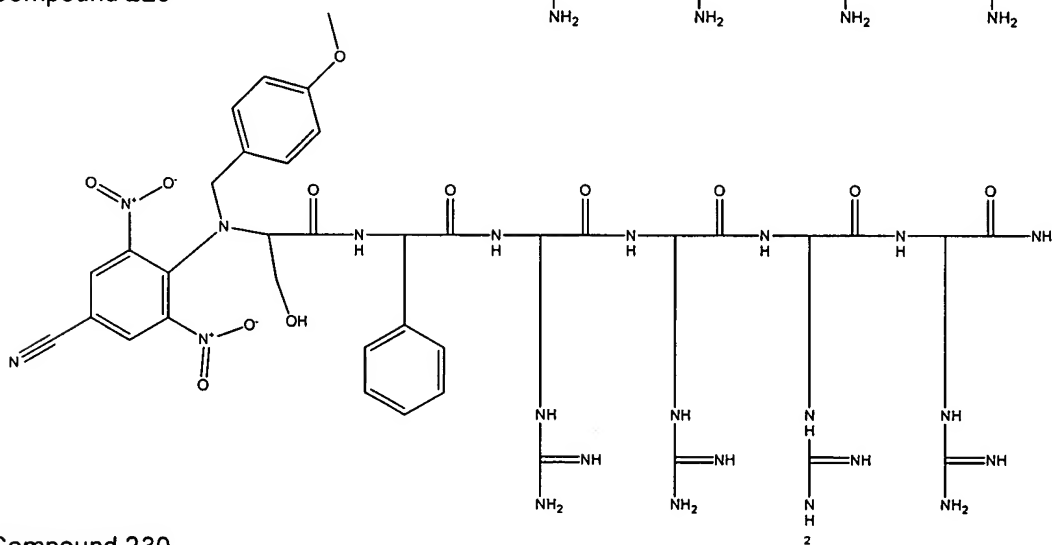
Compound 228



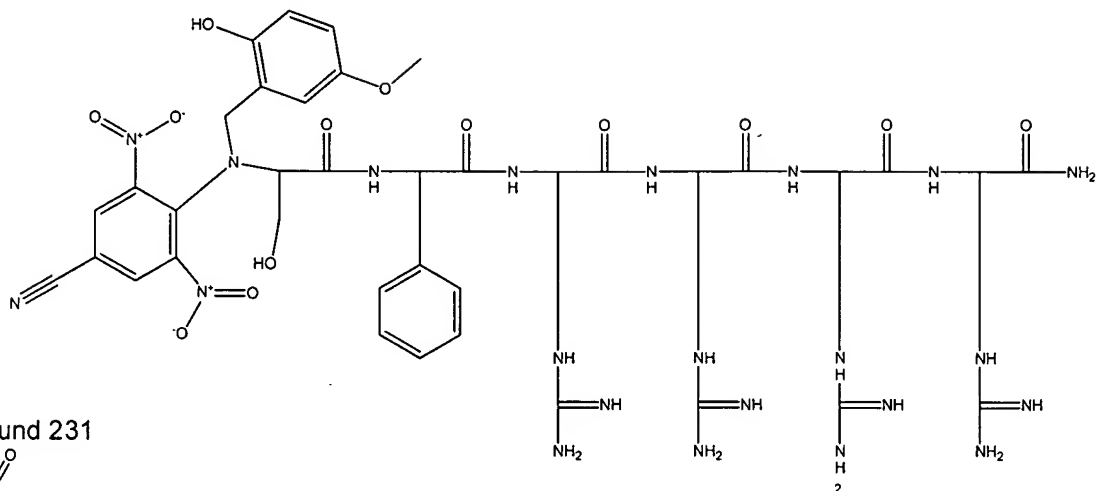
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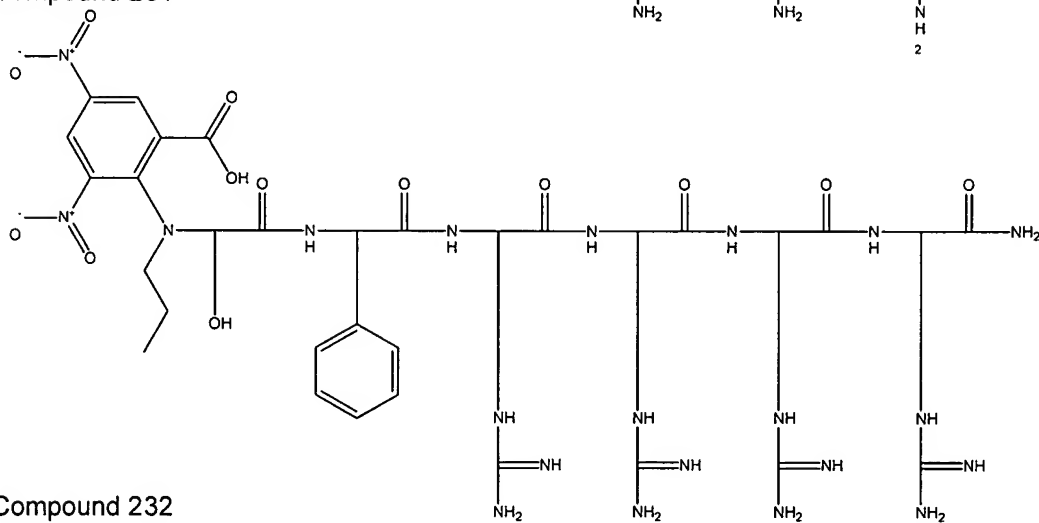
Compound 229



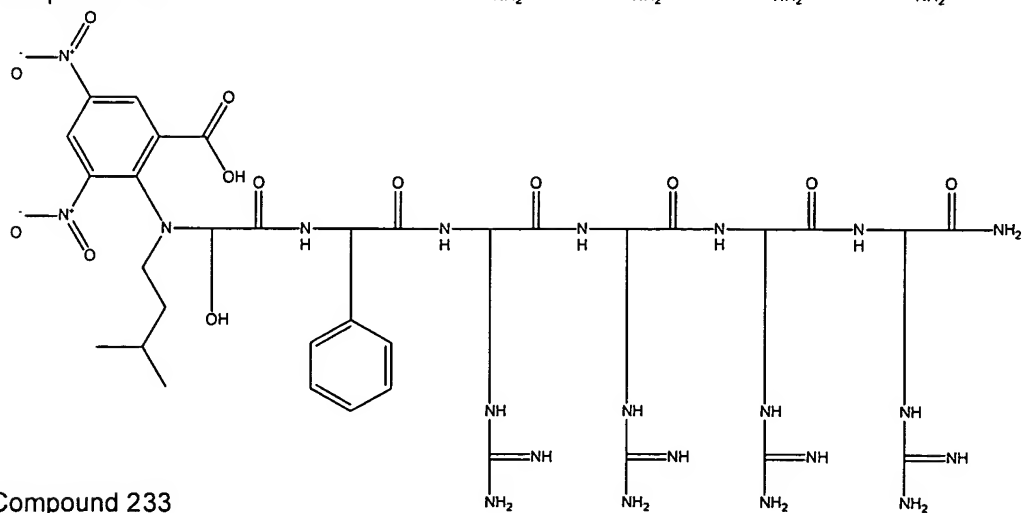
Compound 230



Compound 231

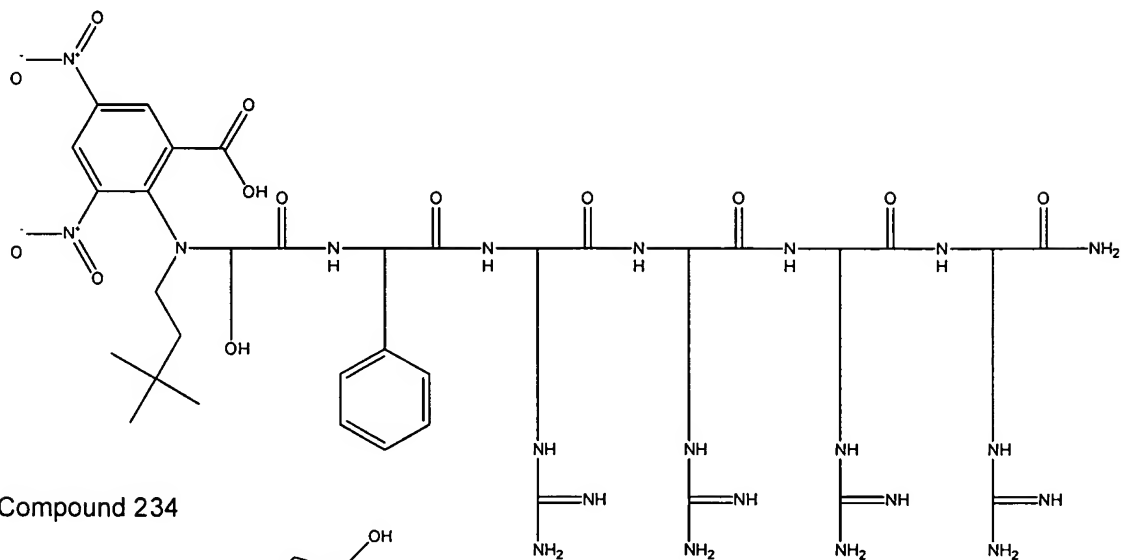


Compound 232

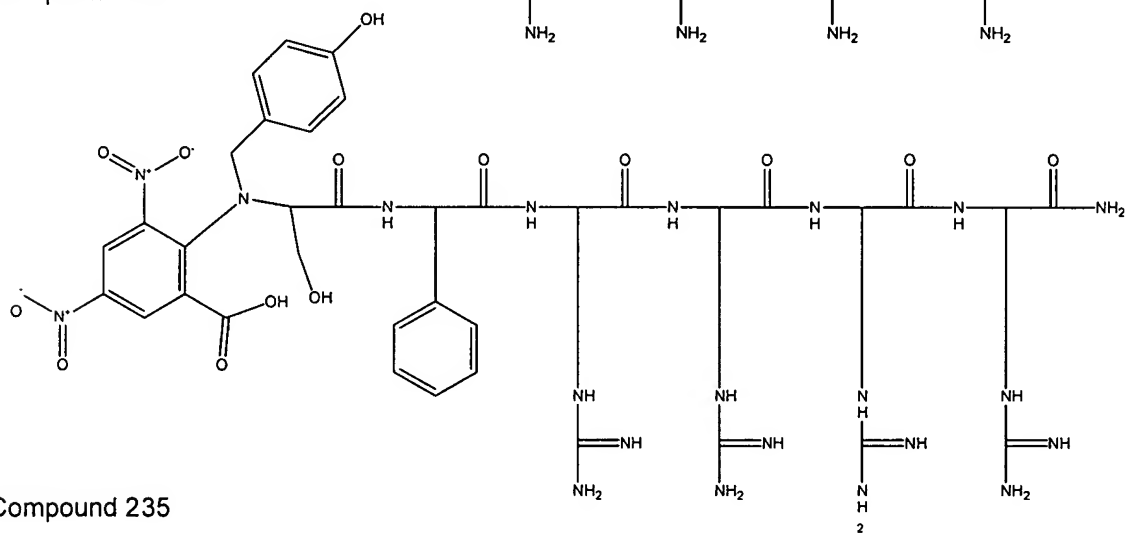


Compound 233

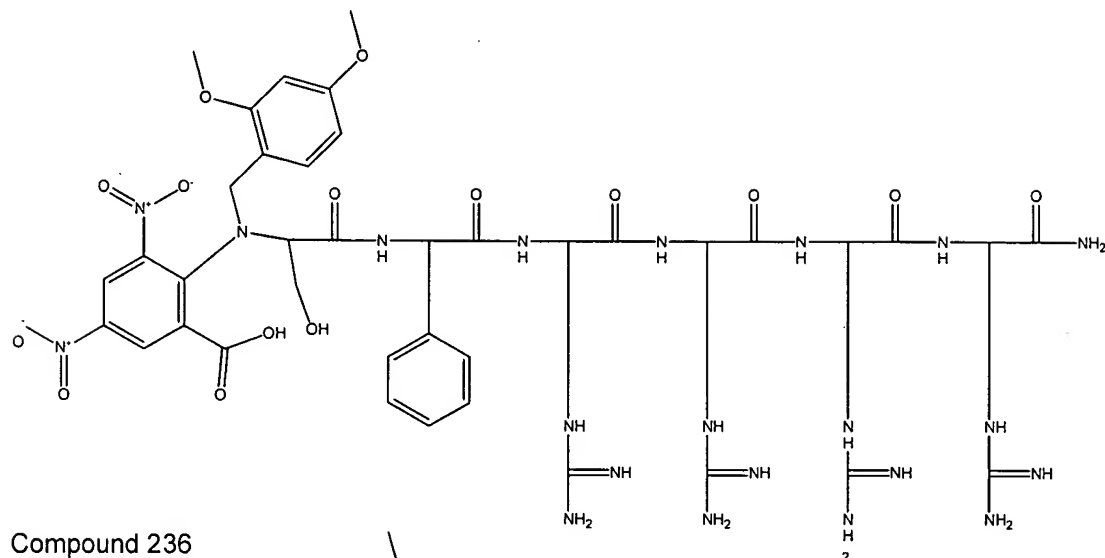
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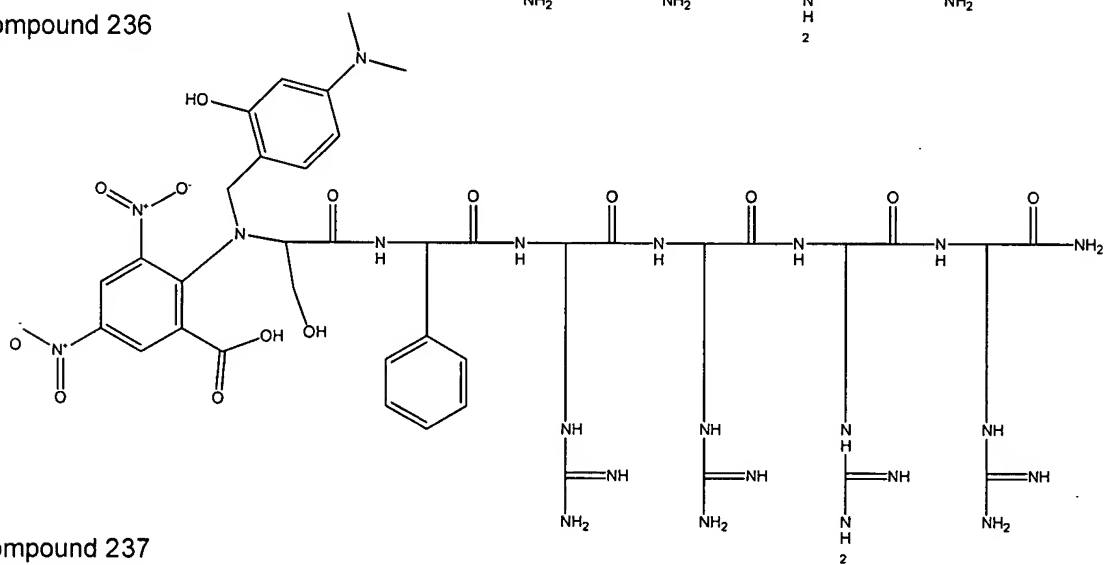
Compound 234



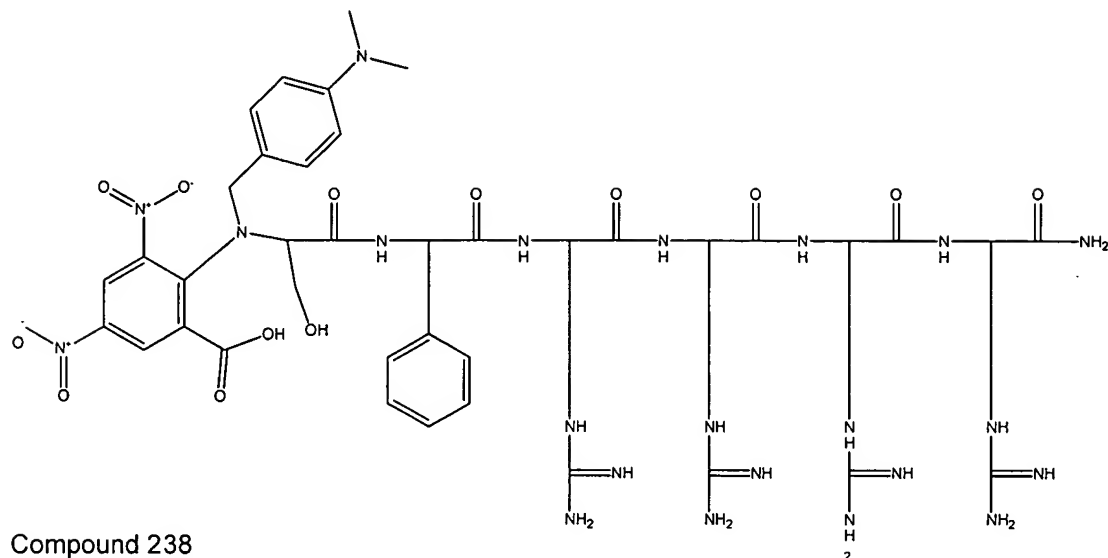
Compound 235



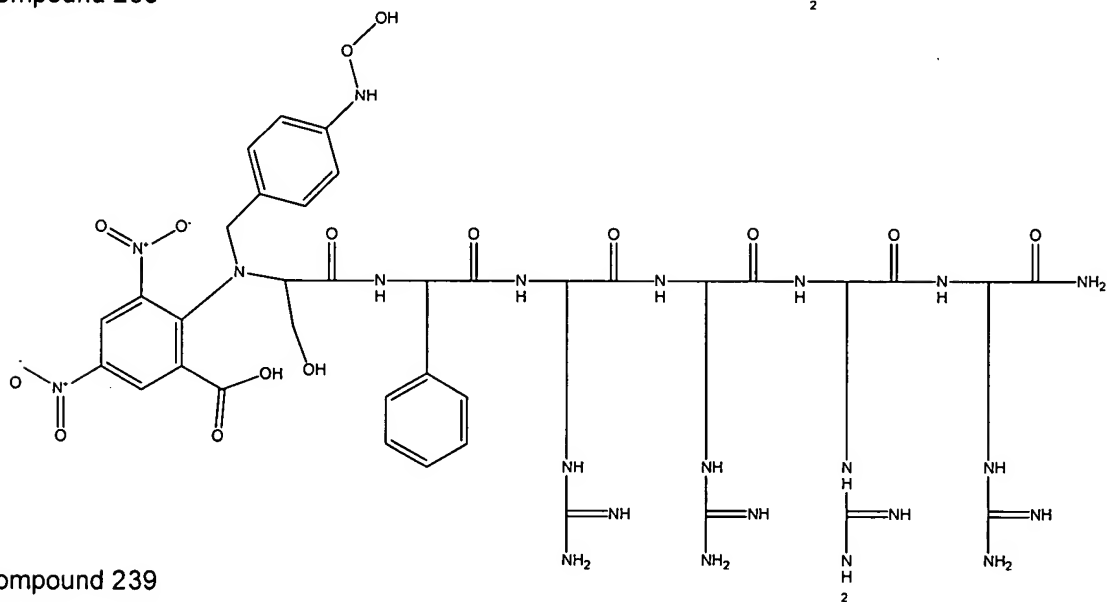
Compound 236



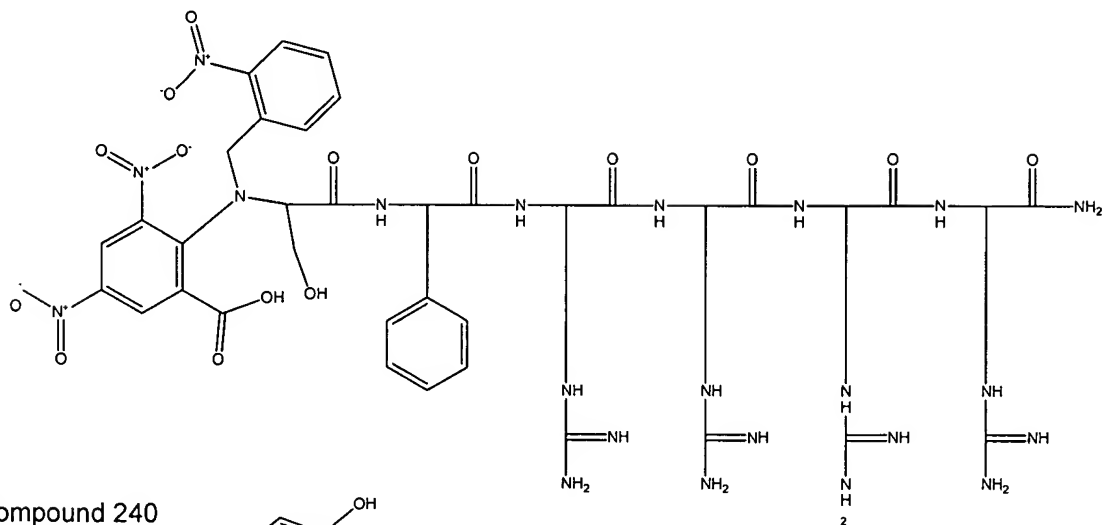
Compound 237



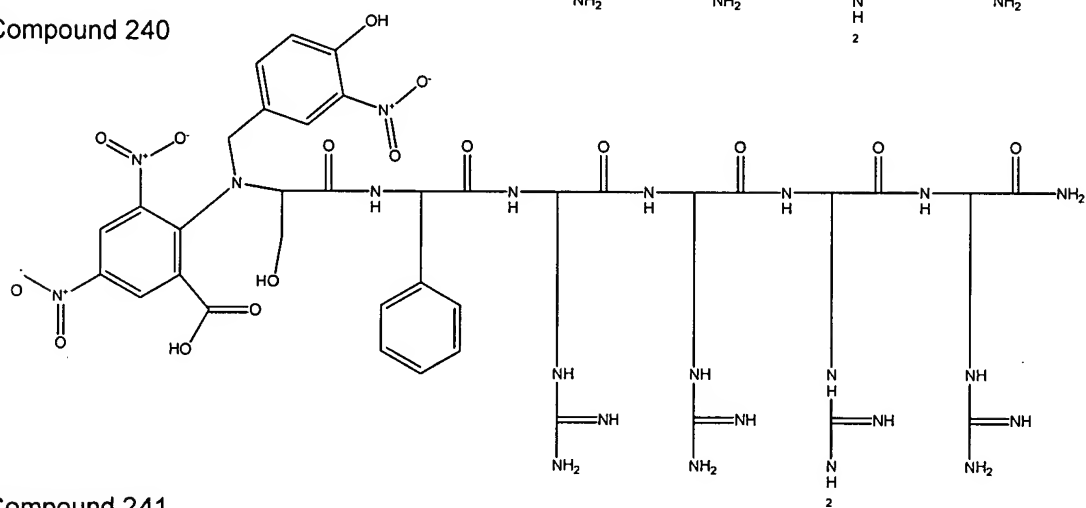
Compound 238



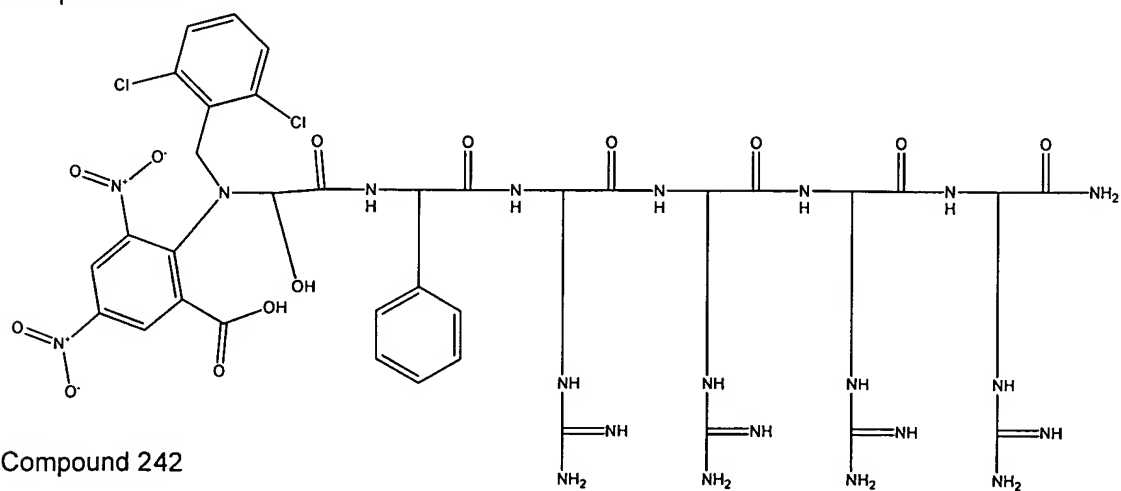
Compound 239



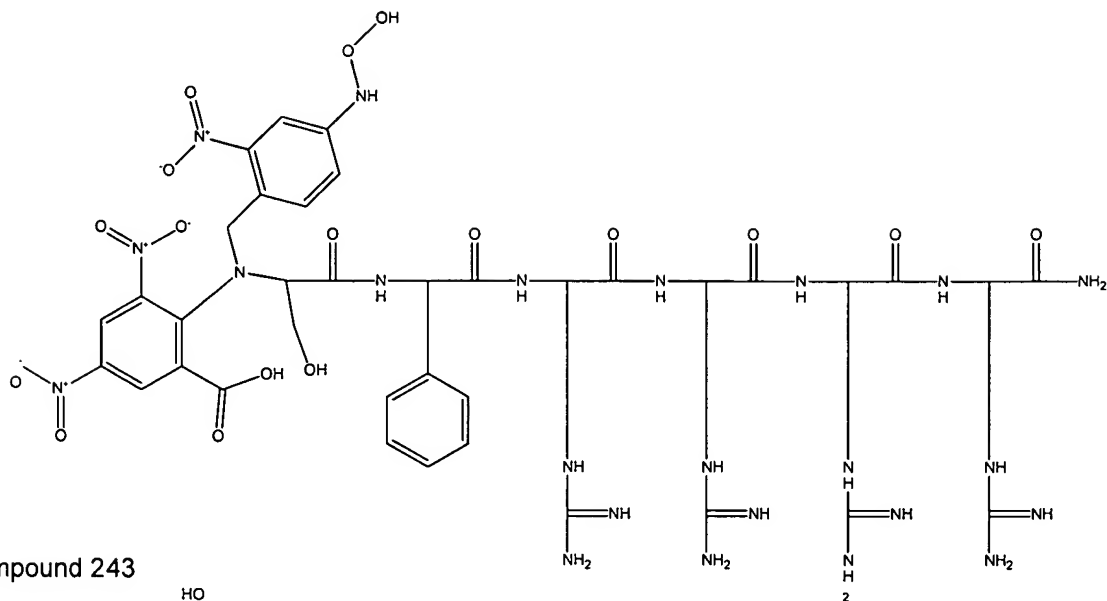
Compound 240



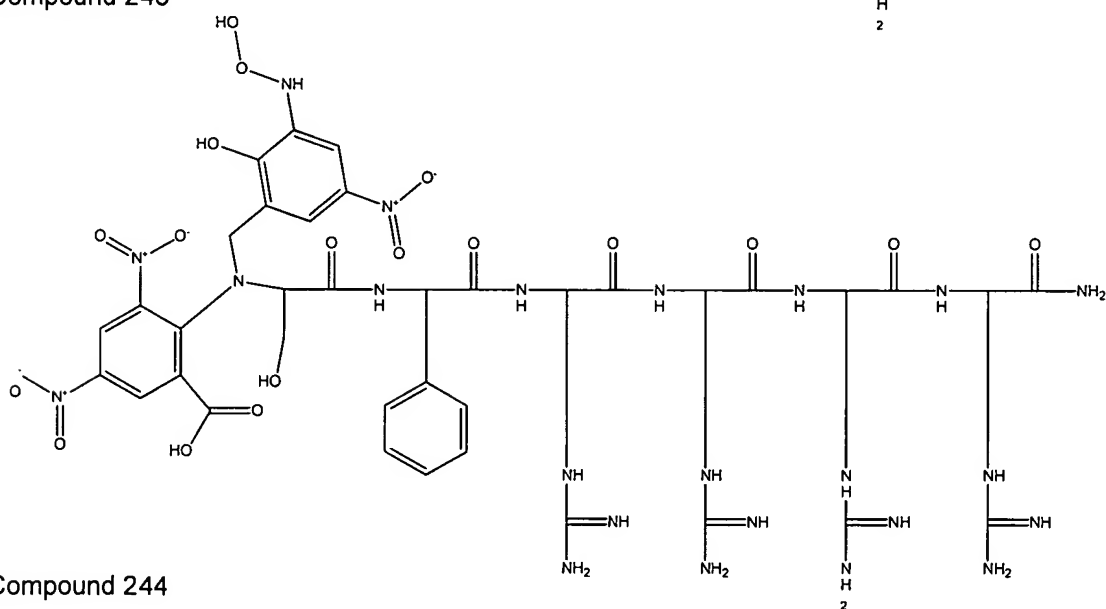
Compound 241



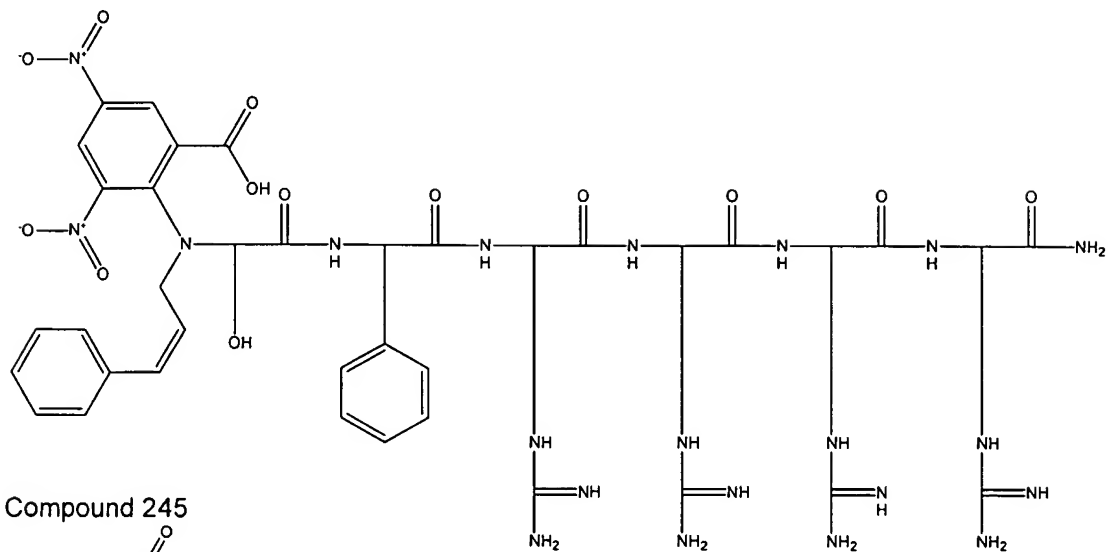
Compound 242



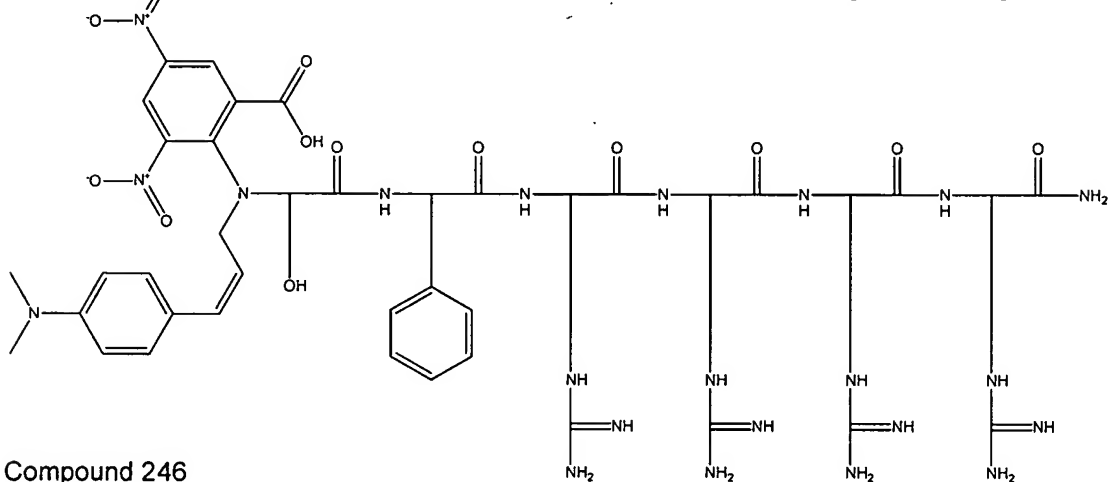
Compound 243



Compound 244

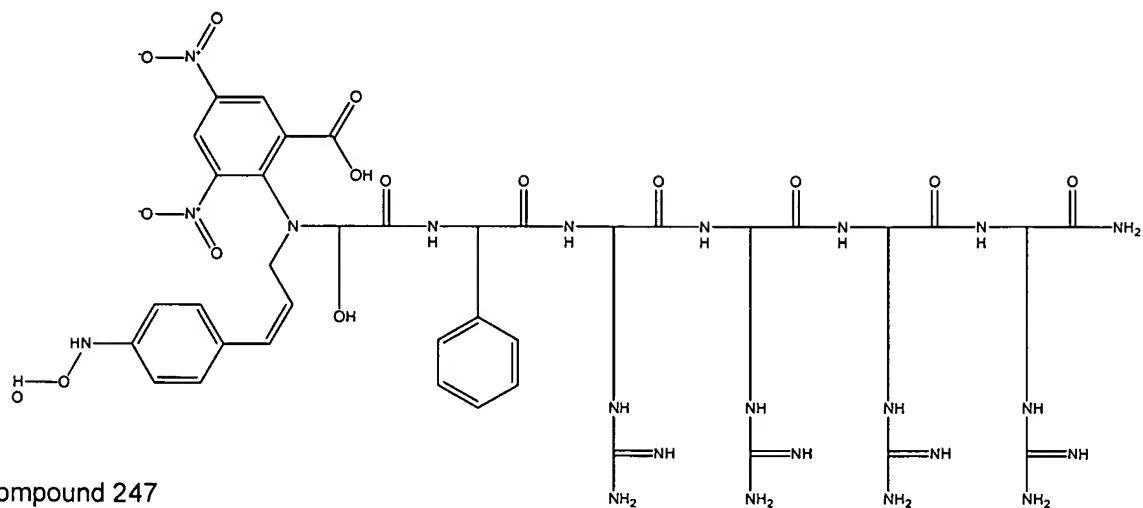


Compound 245

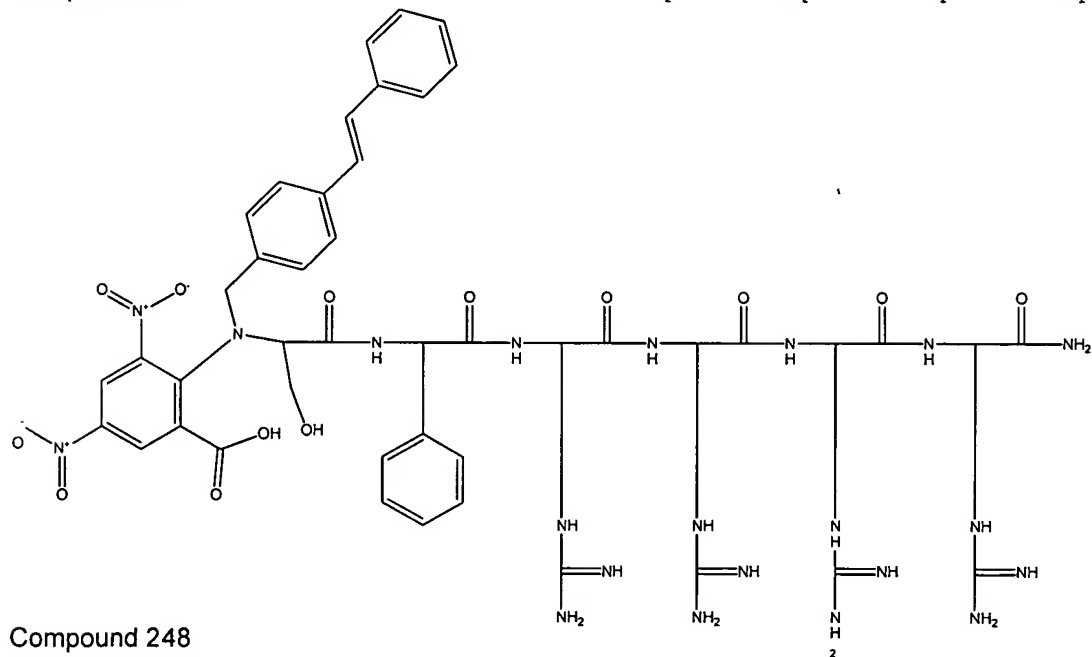


Compound 246

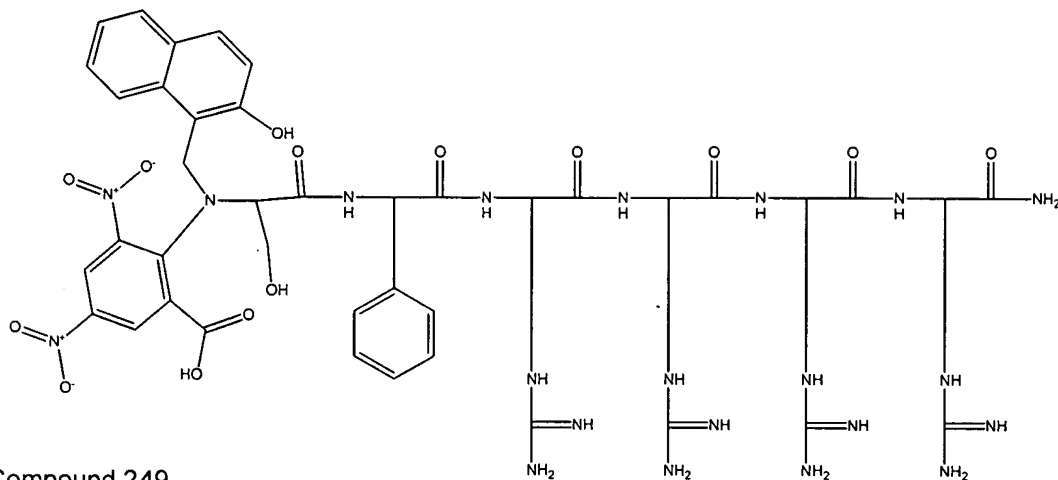




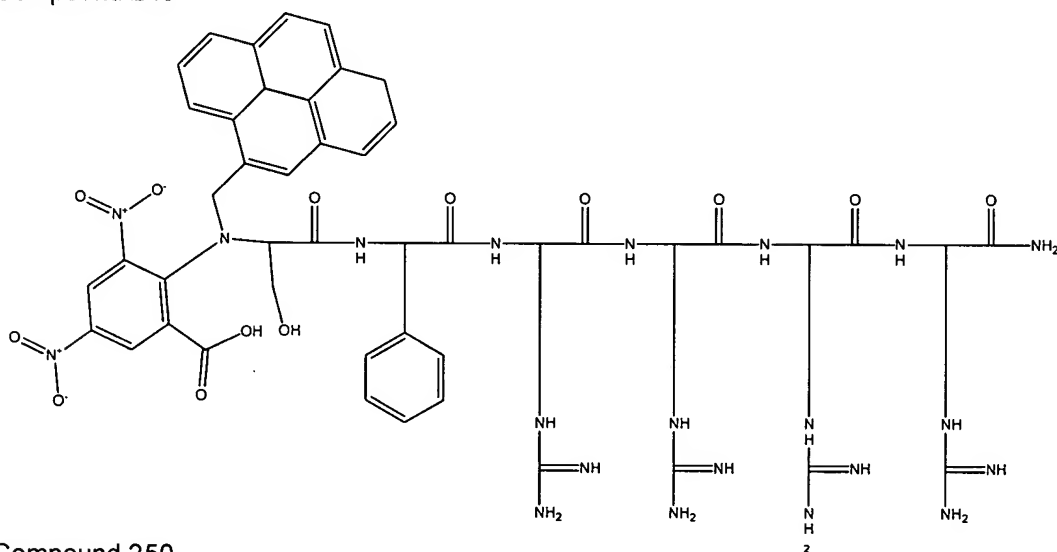
Compound 247



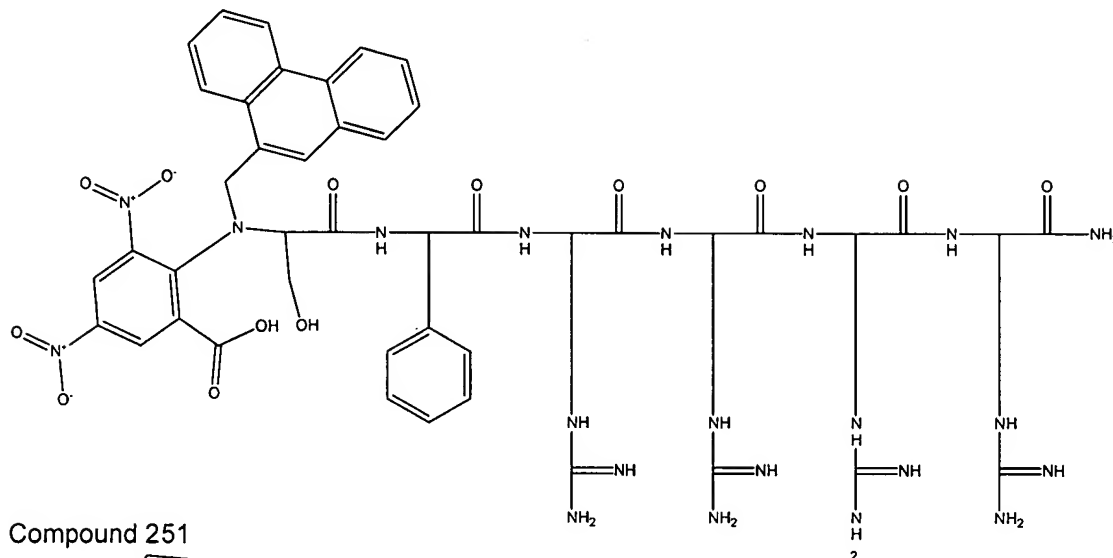
Compound 248



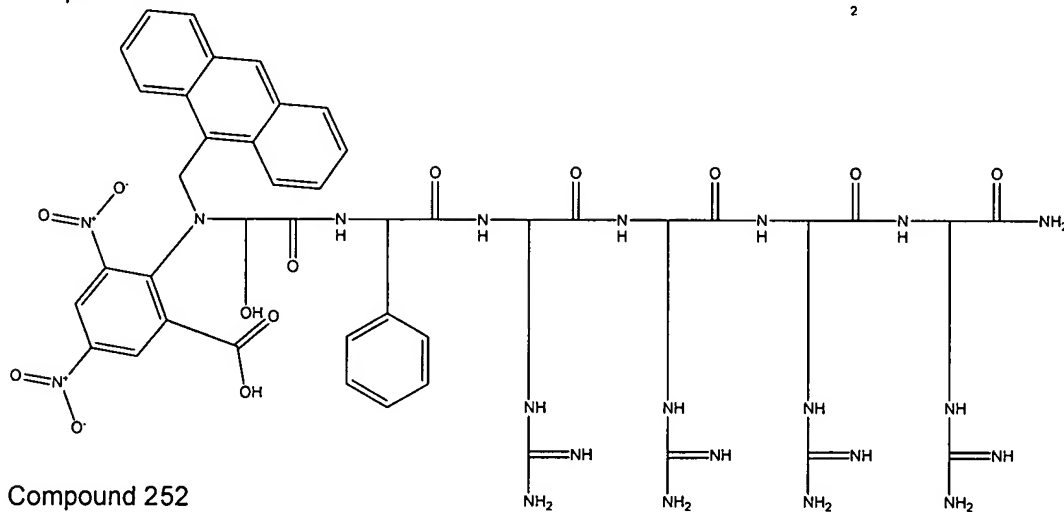
Compound 249



Compound 250

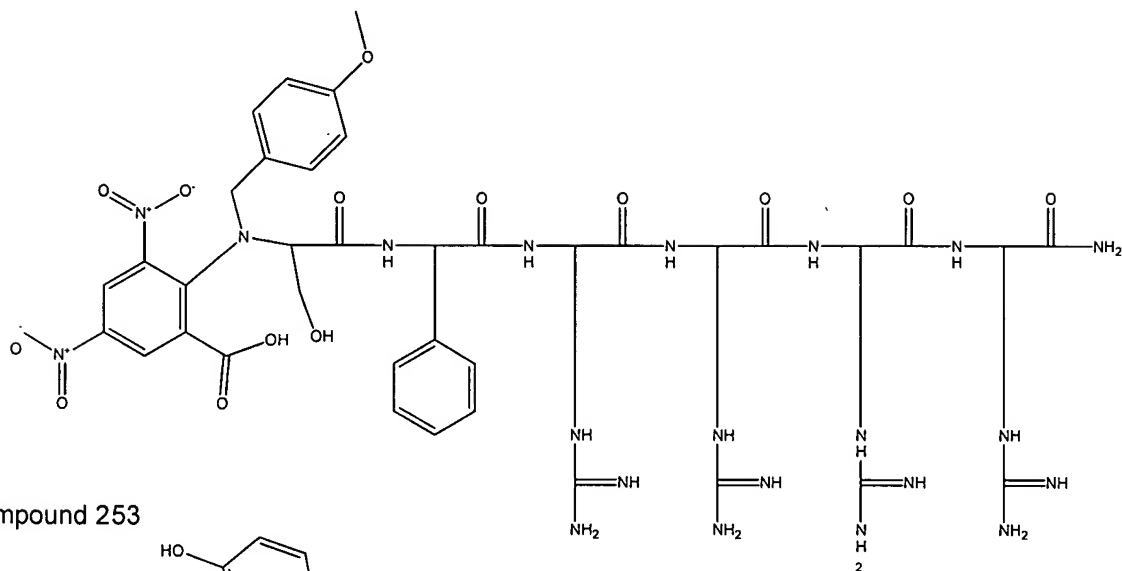


Compound 251

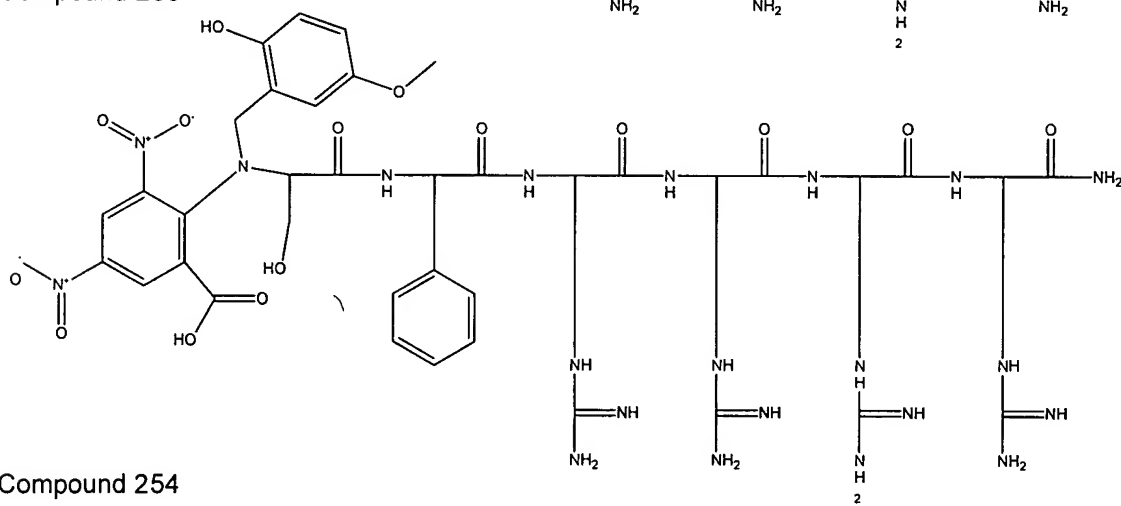


Compound 252

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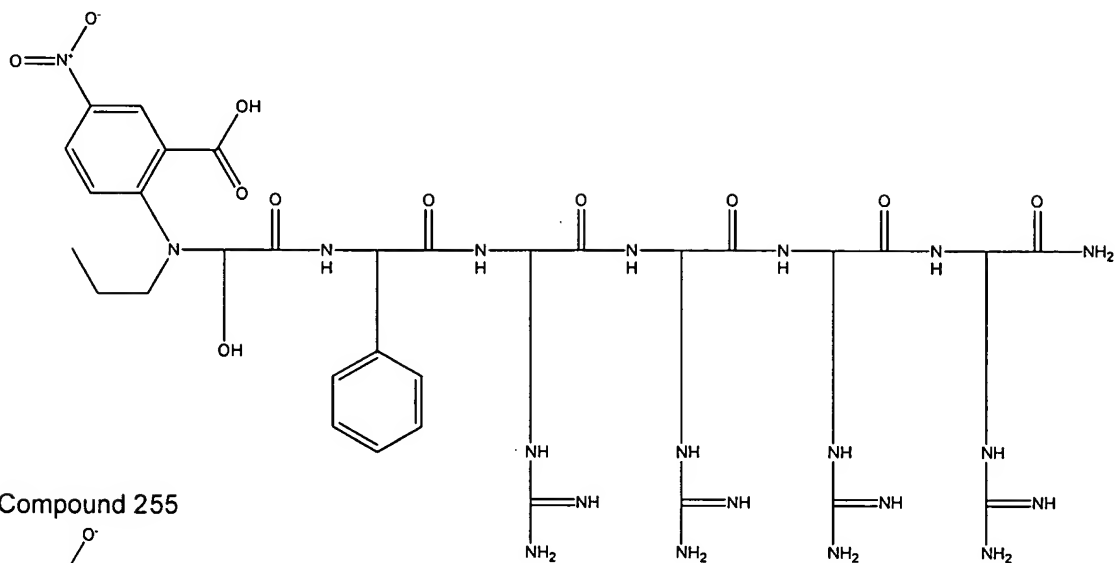


Compound 253

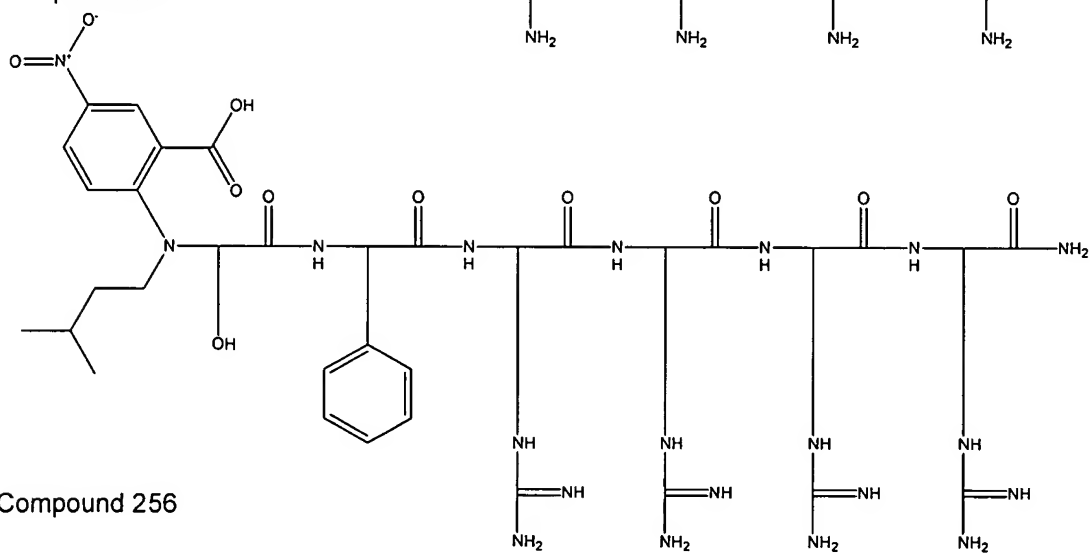


Compound 254

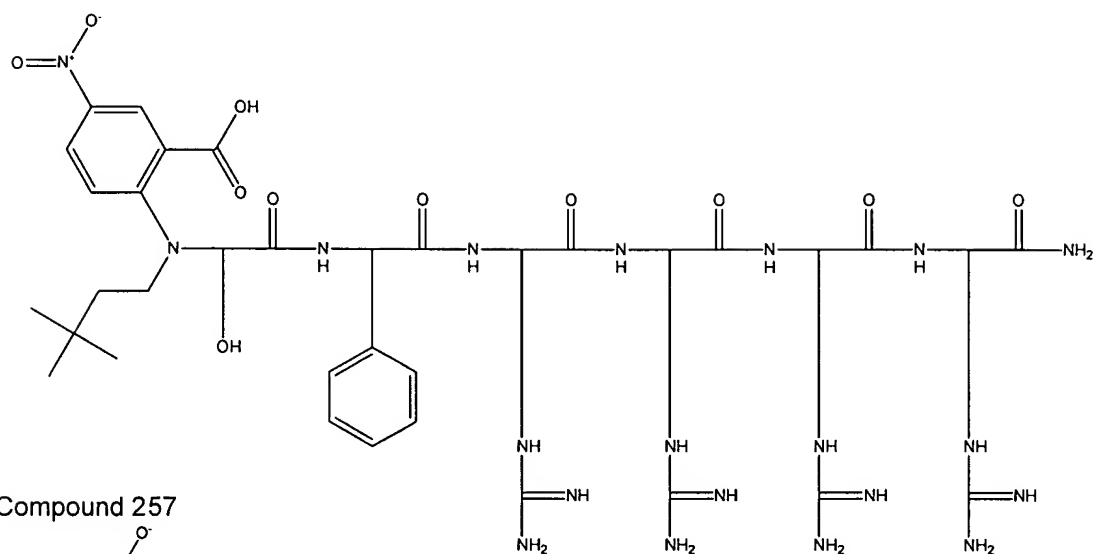
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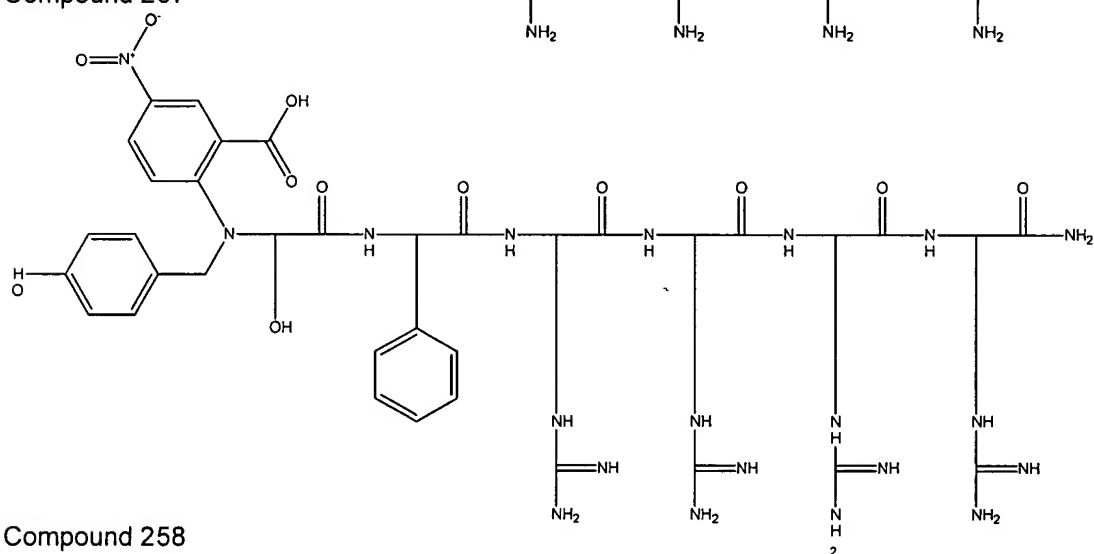
Compound 255



Compound 256

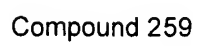


Compound 257

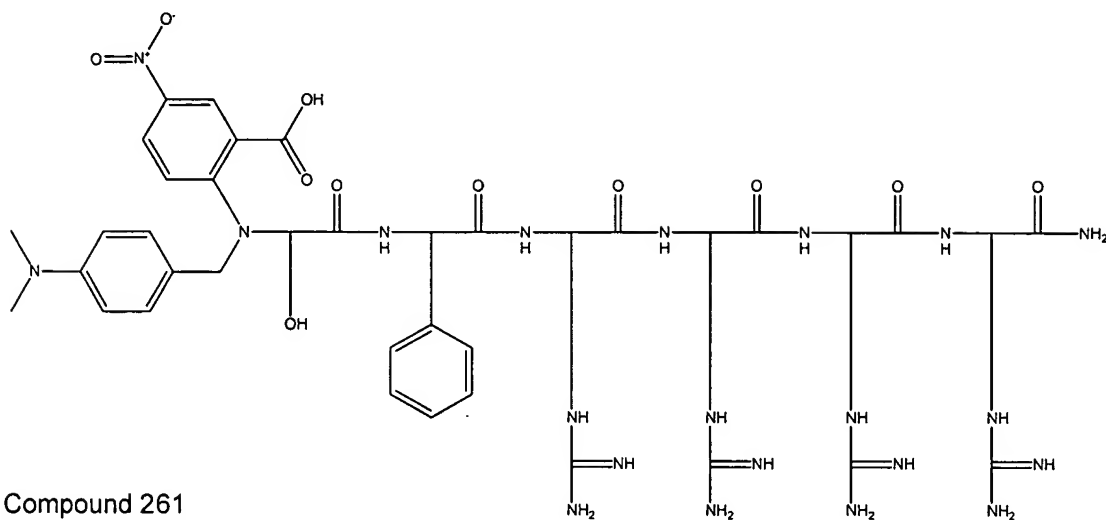


Compound 258

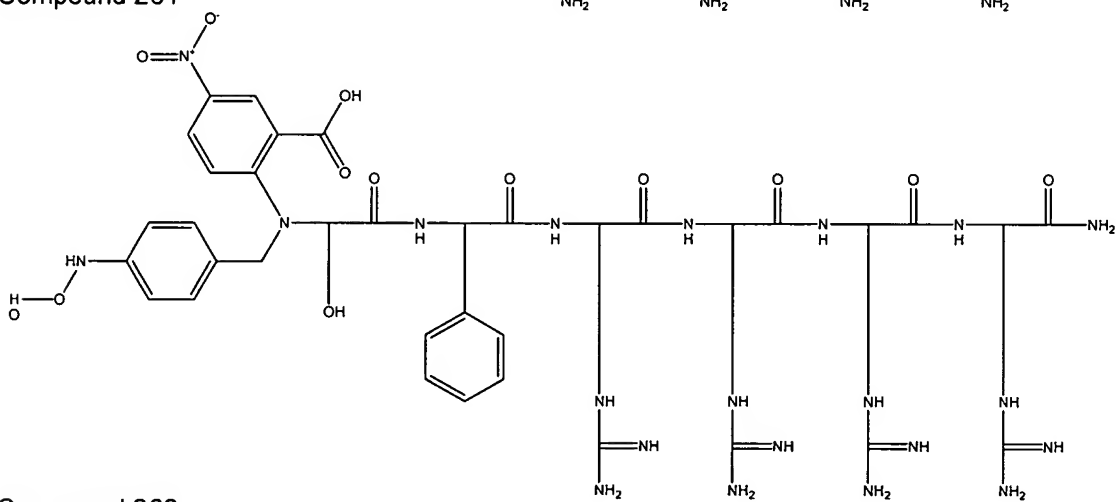
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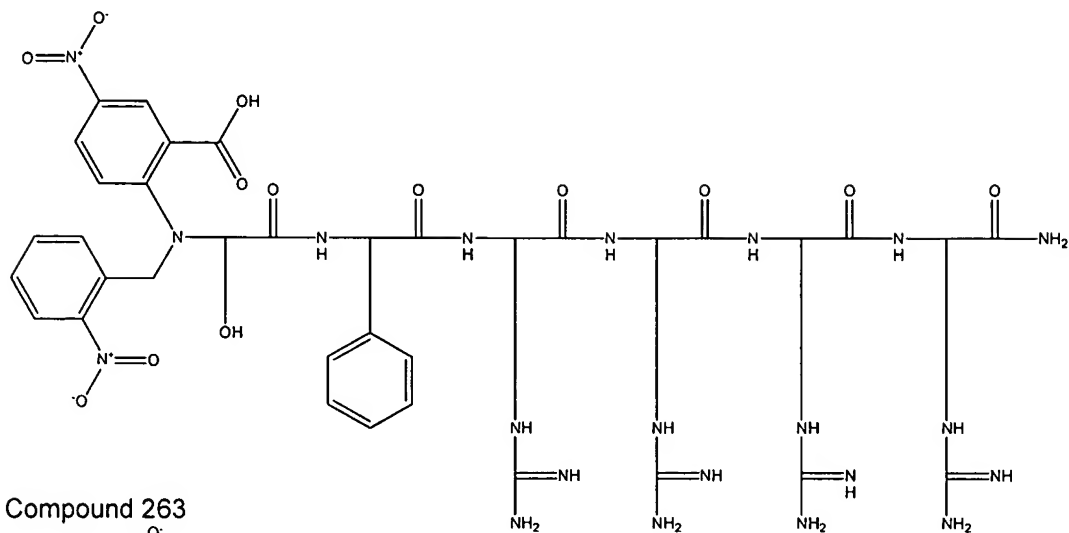
Compound 261



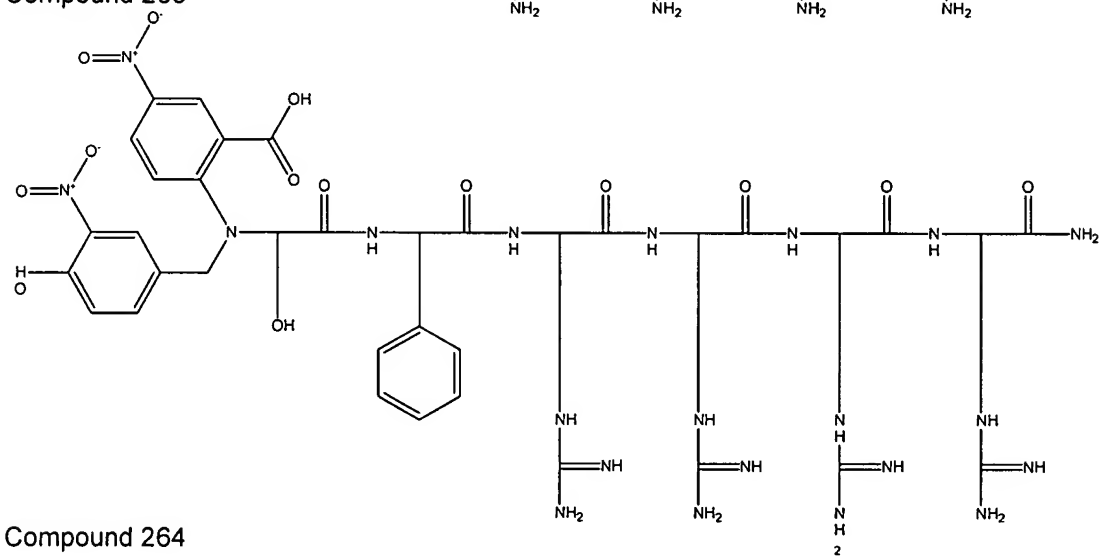
Compound 262



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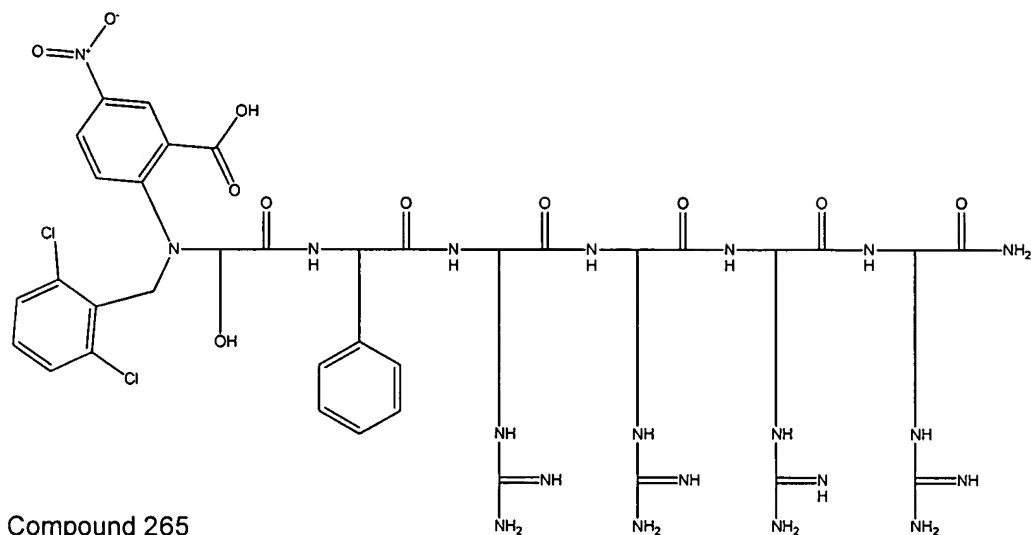


Compound 263

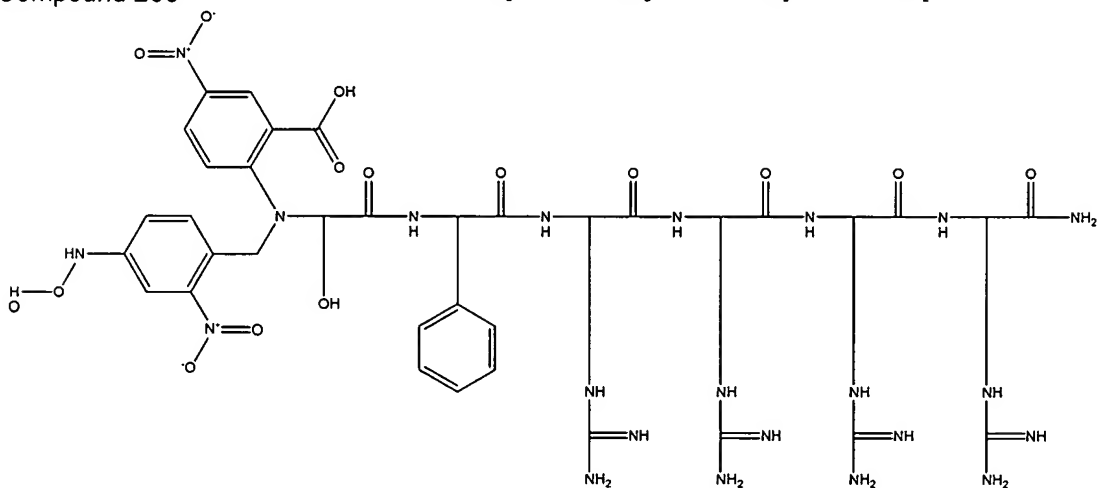


Compound 264

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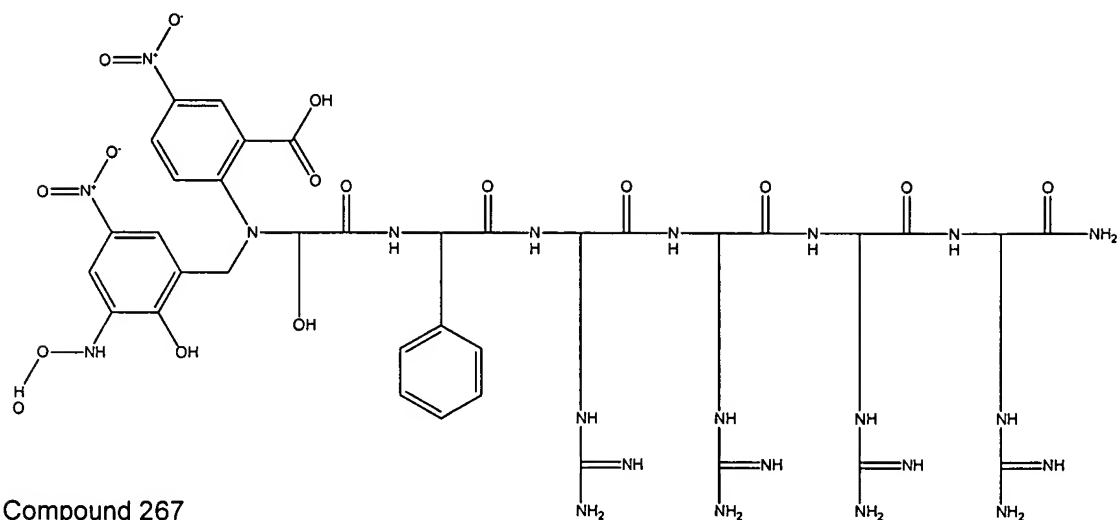


Compound 265

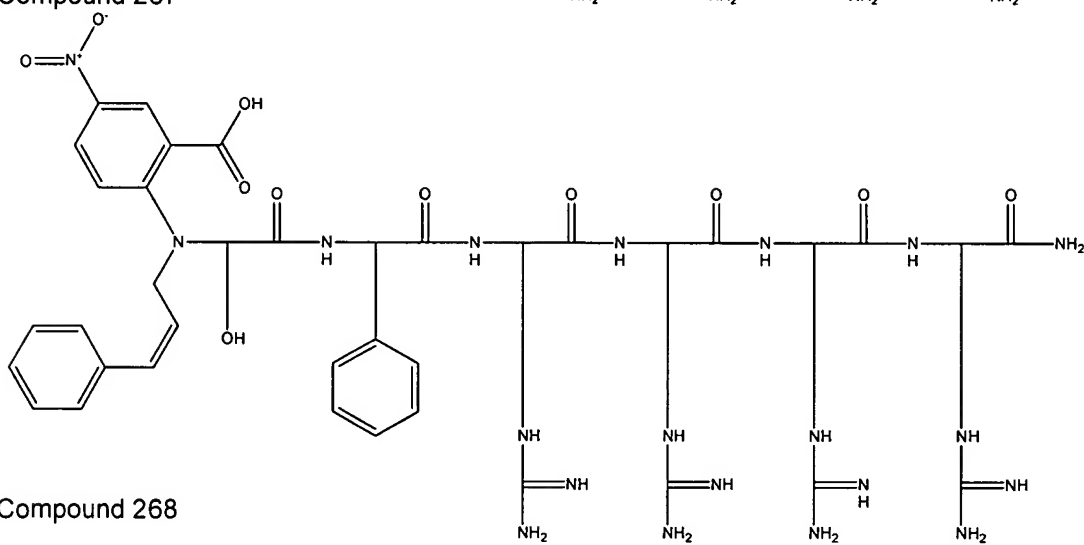


Compound 266

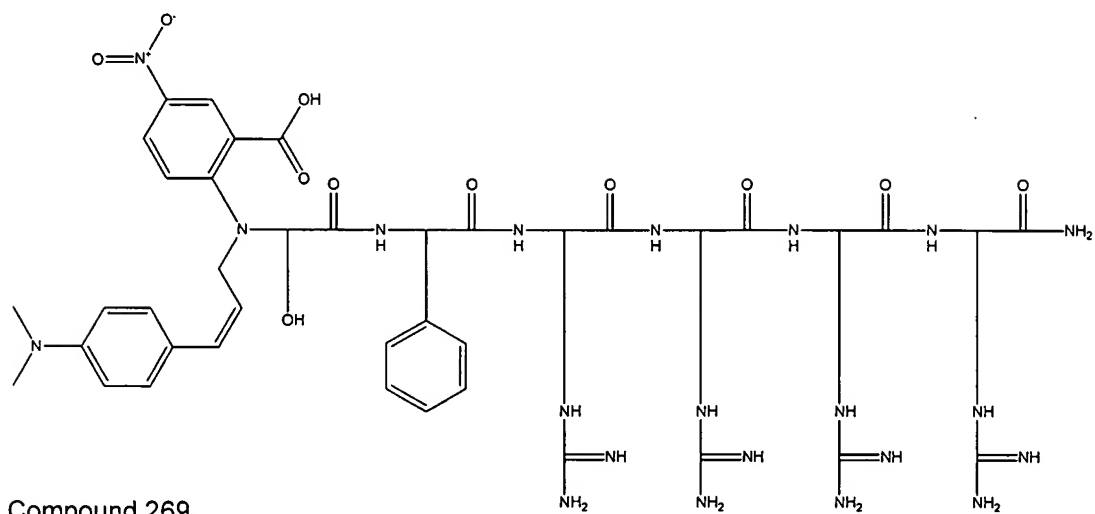
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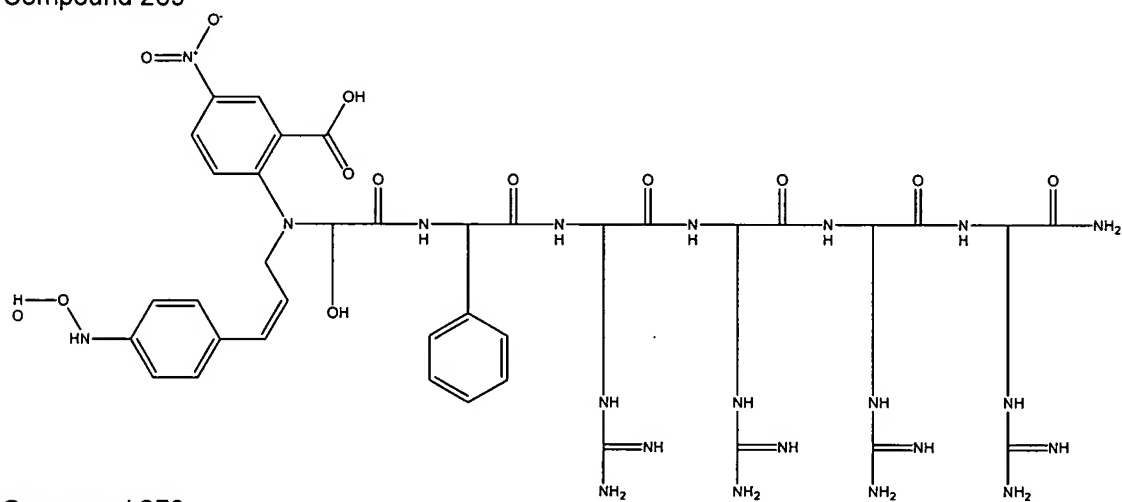
Compound 267



Compound 268

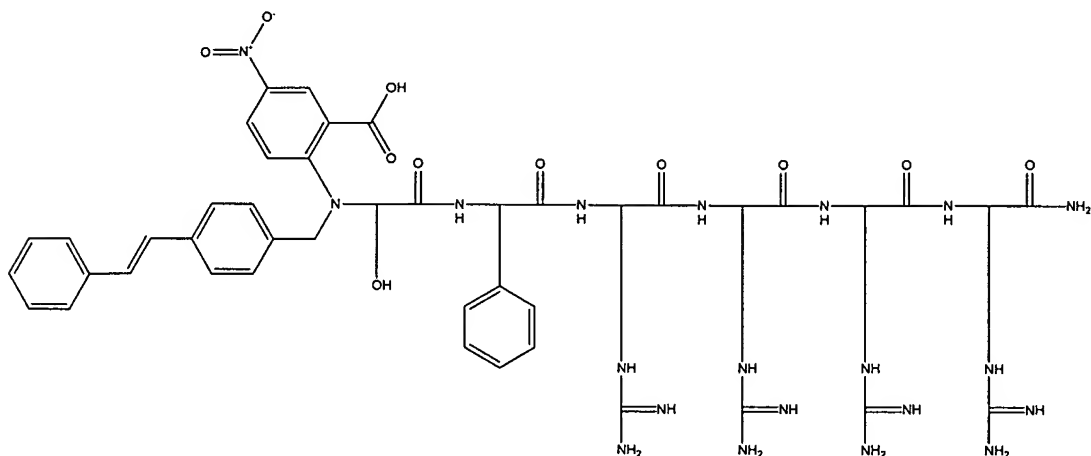


Compound 269



Compound 270

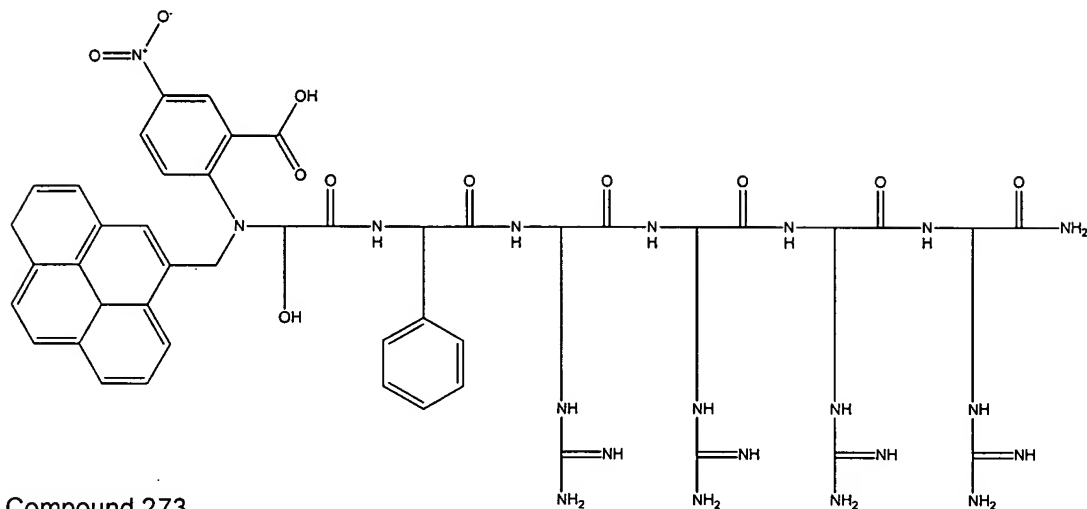
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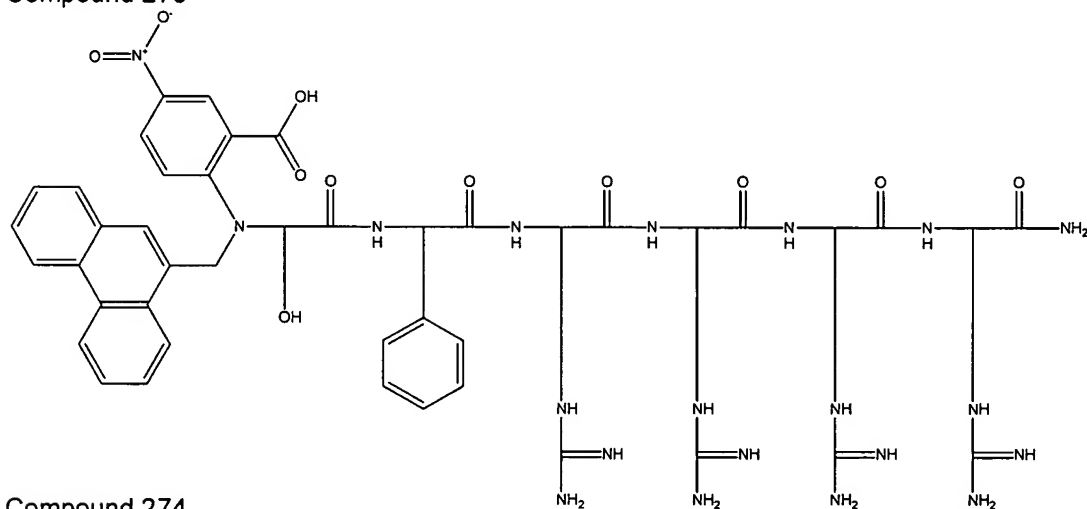
Compound 272

Chemical structure of Compound 272, a long-chain peptide derivative. The structure features a 1-((2-hydroxy-1-naphthyl)methyl)-4-nitrophenyl group at the N-terminus, followed by a sequence of seven amide bonds. The side chains include a hydroxyl group, a benzyl group, and four guanidino groups. The C-terminus is a primary amide (NH<sub>2</sub>).

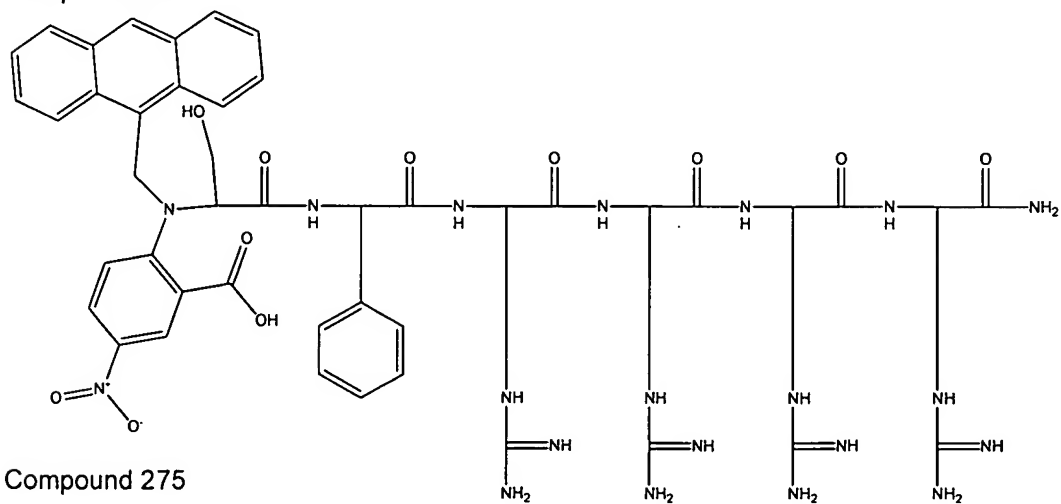
### Compound 272



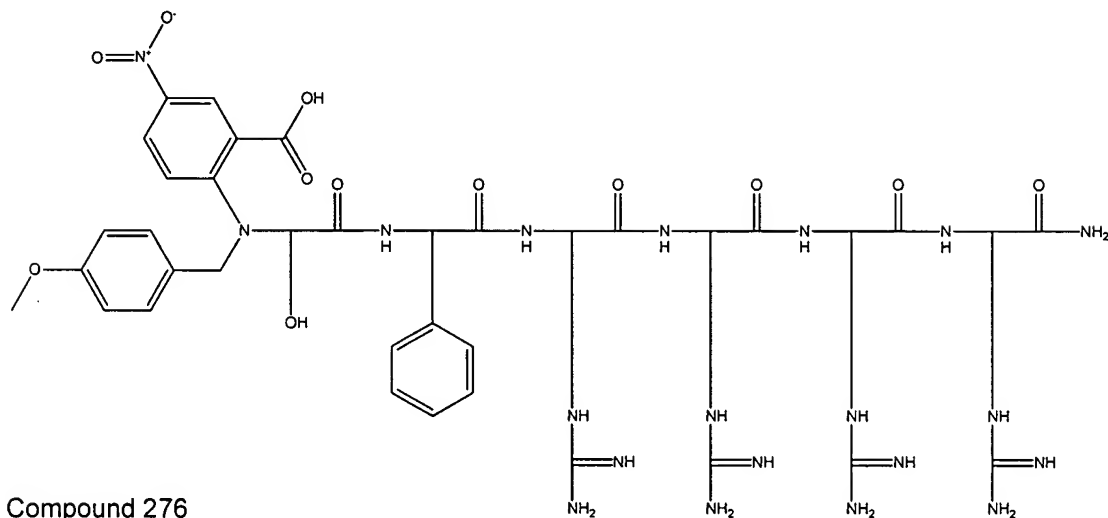
Compound 273



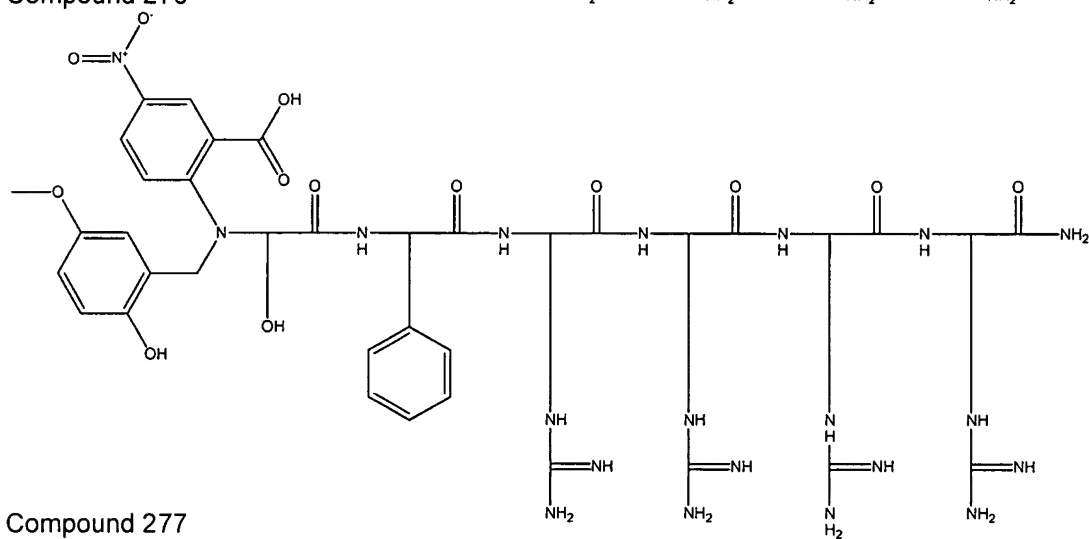
Compound 274



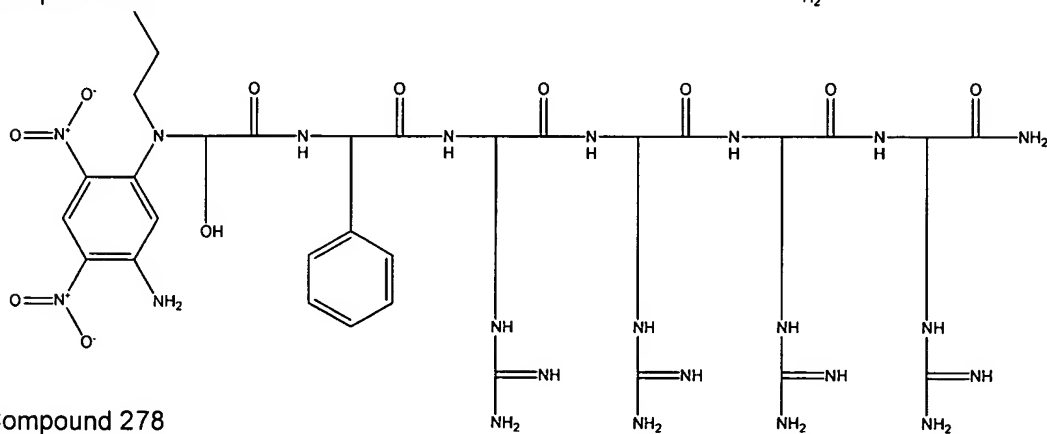
Compound 275



Compound 276



Compound 277



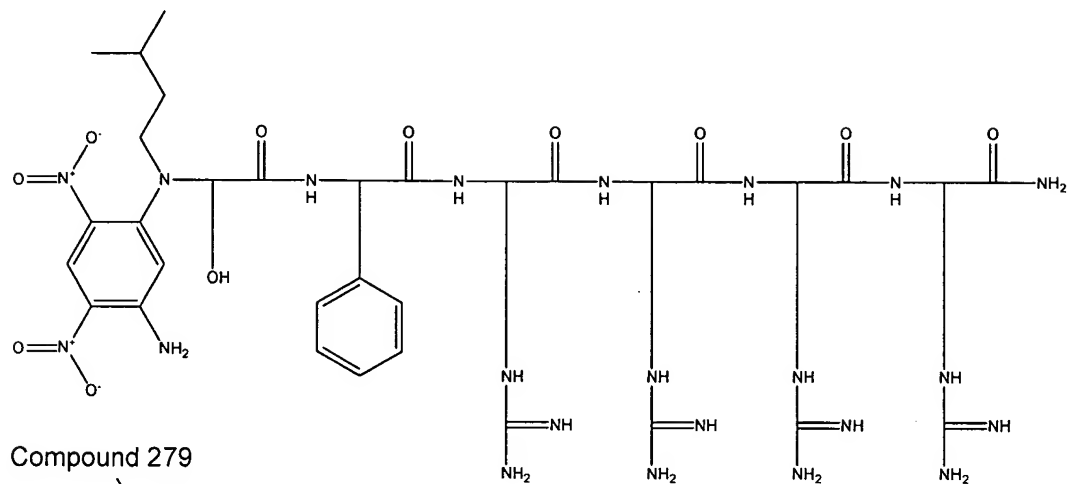
Compound 278

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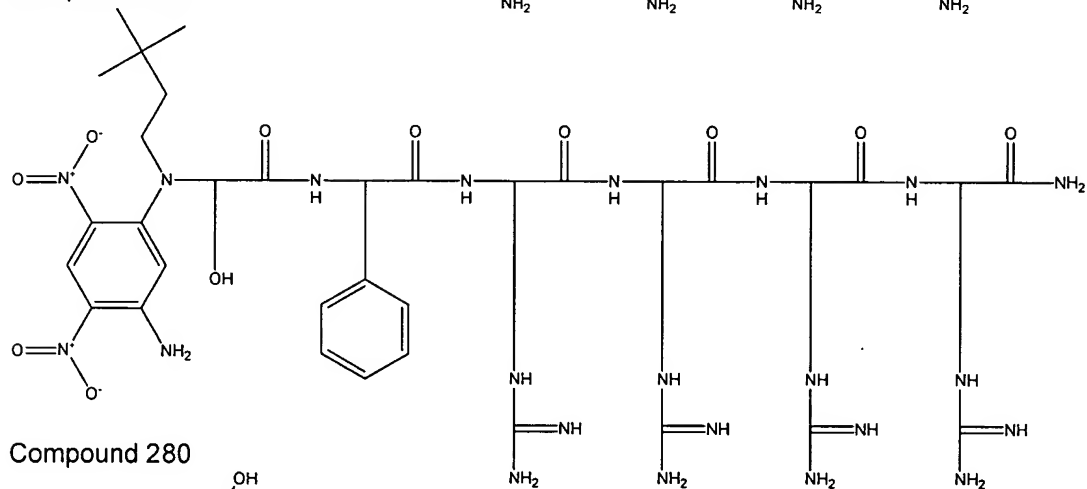
Serial No.: 10/755,086

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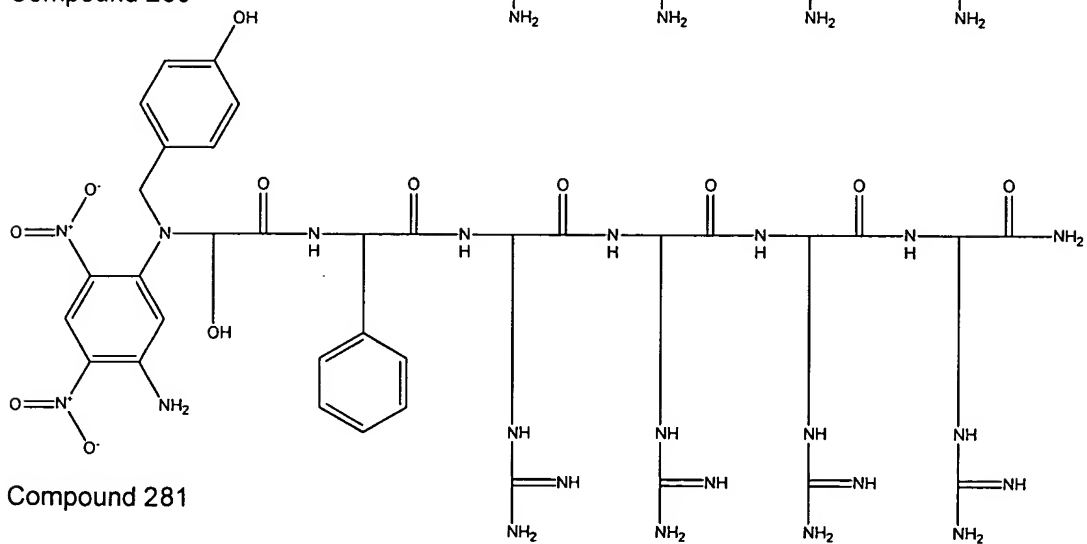
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Compound 279



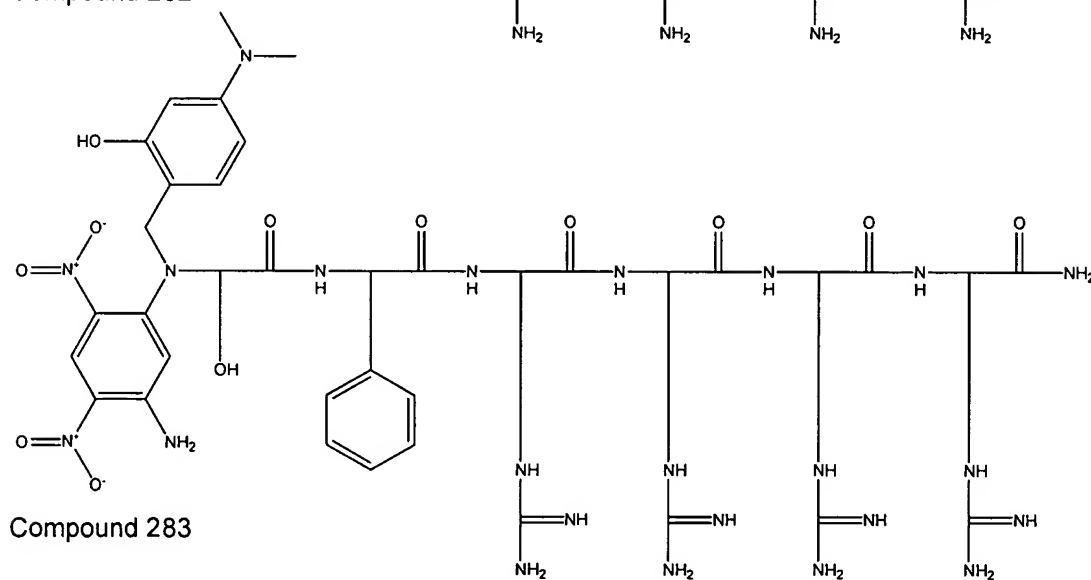
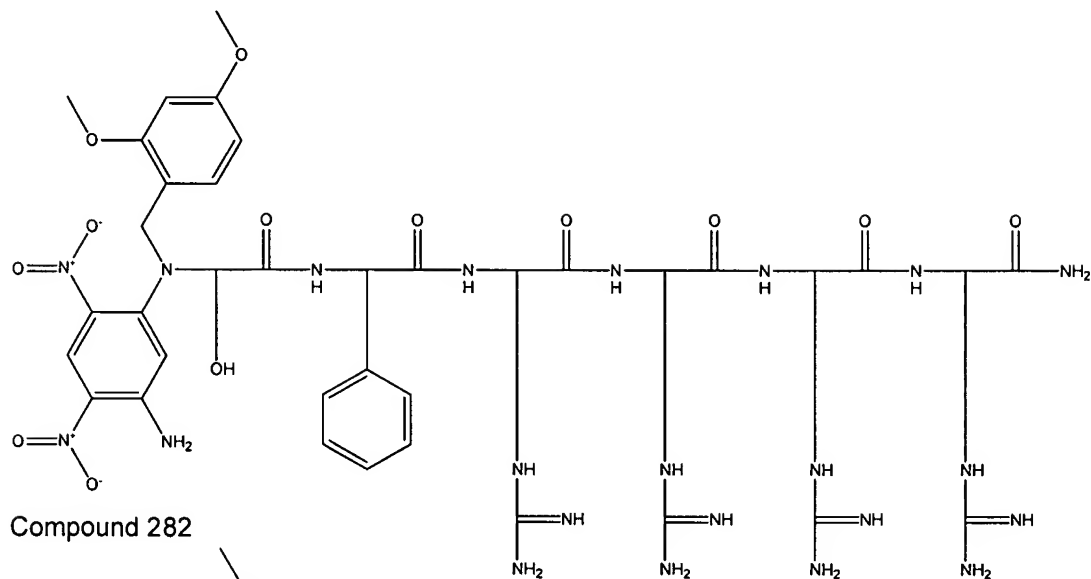
Compound 280

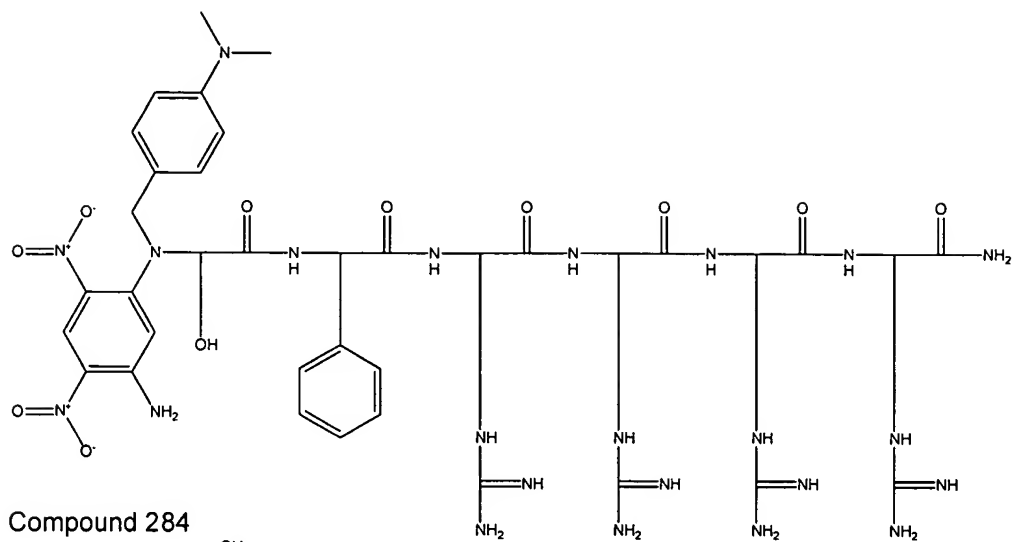


Compound 281

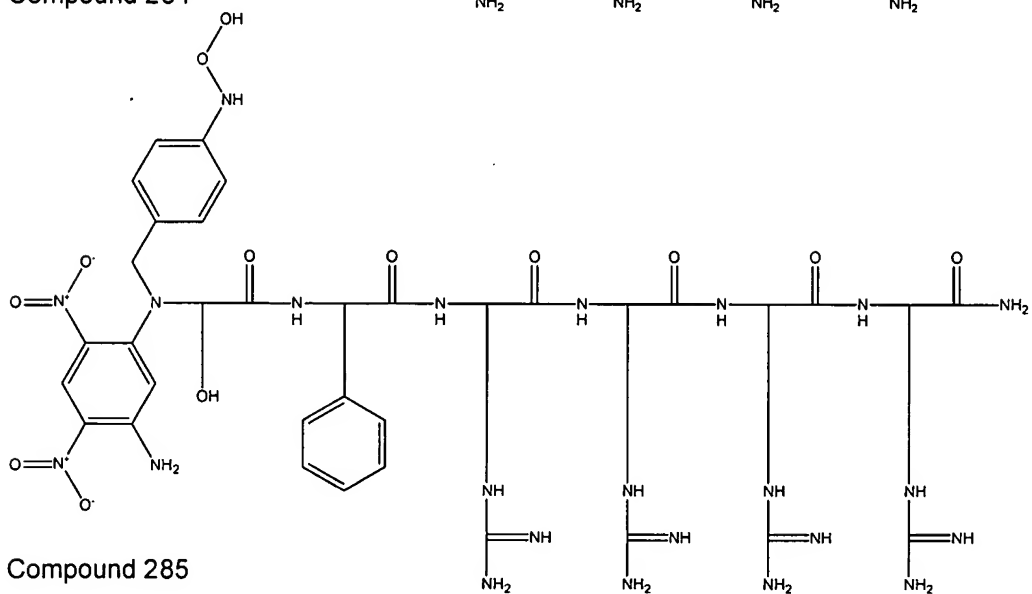


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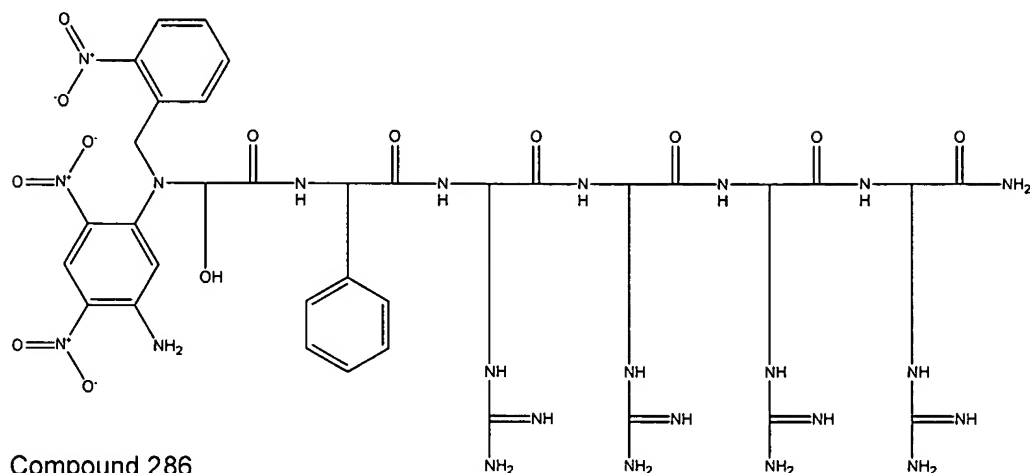




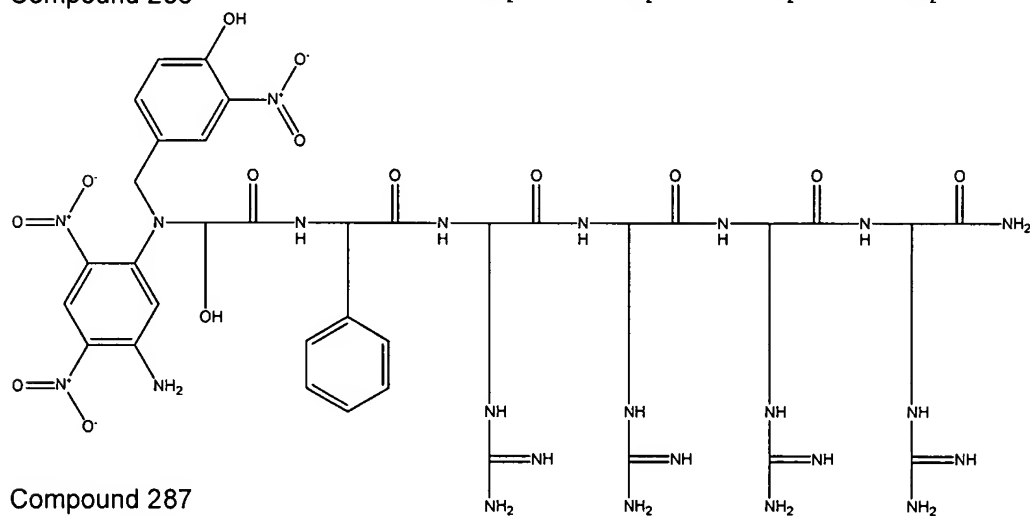
Compound 284



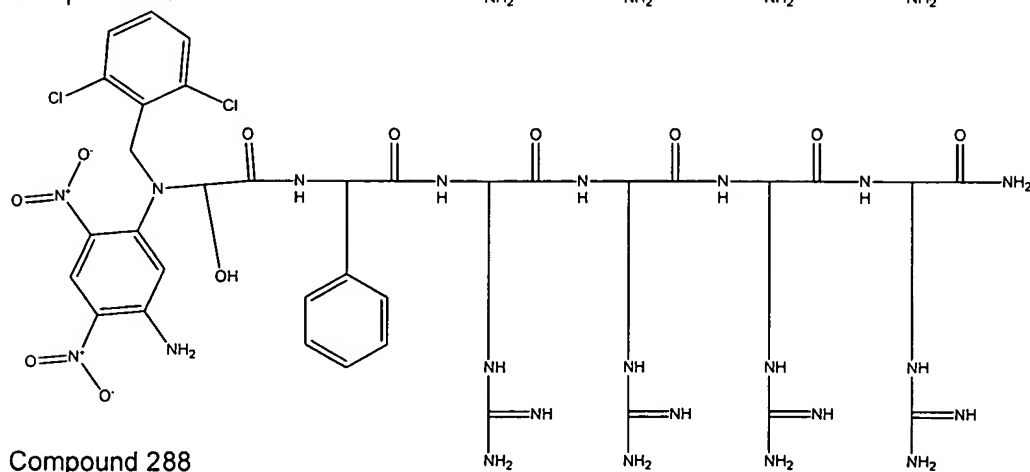
Compound 285



Compound 286

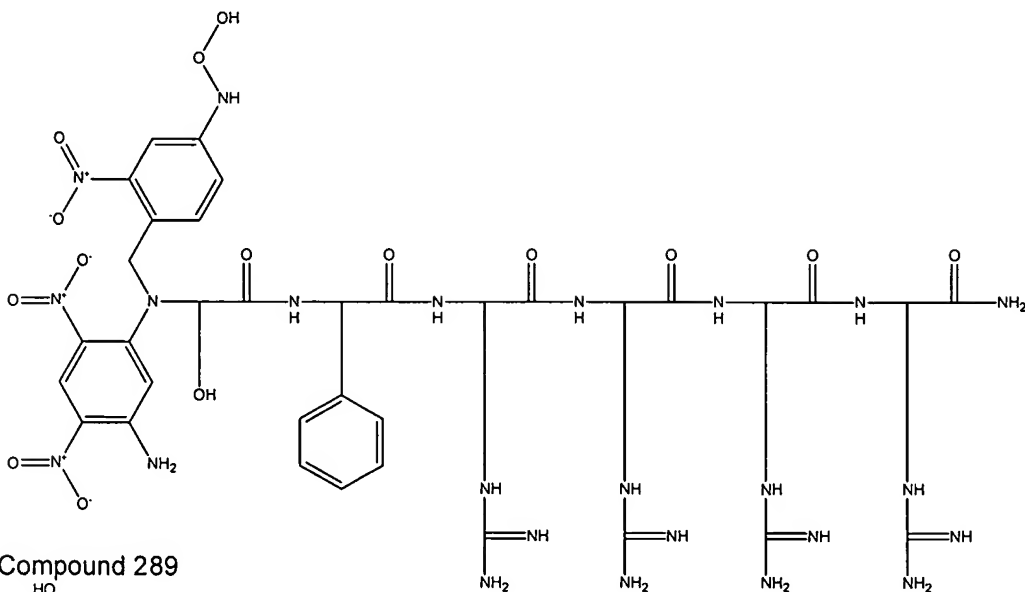


Compound 287

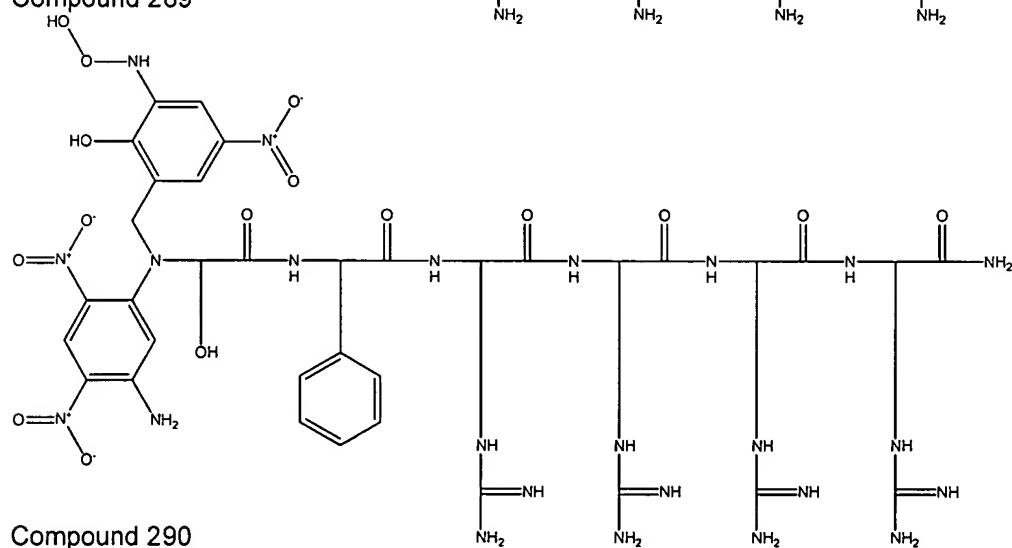


Compound 288

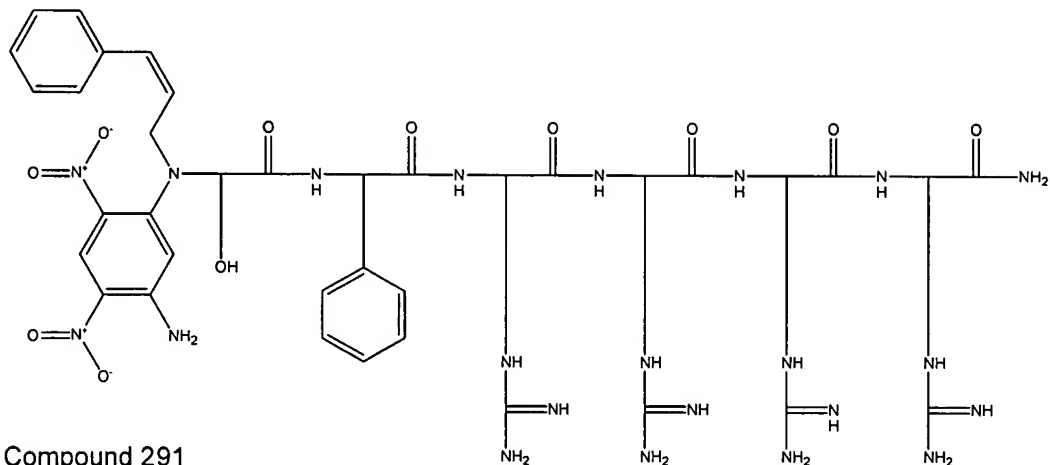
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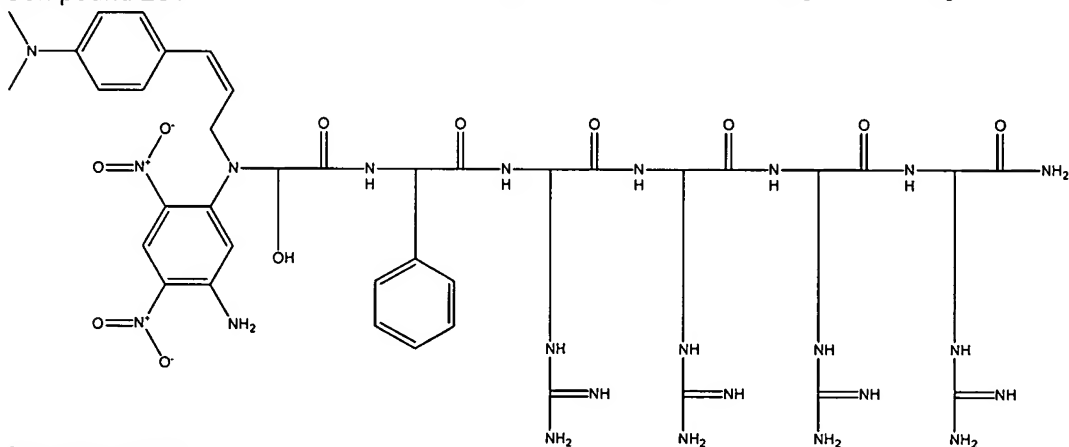
Compound 289



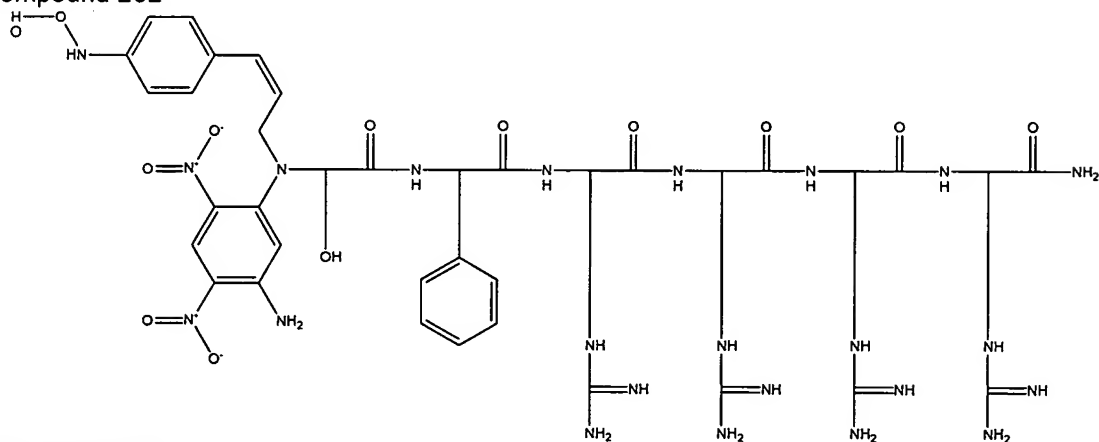
Compound 290



Compound 291



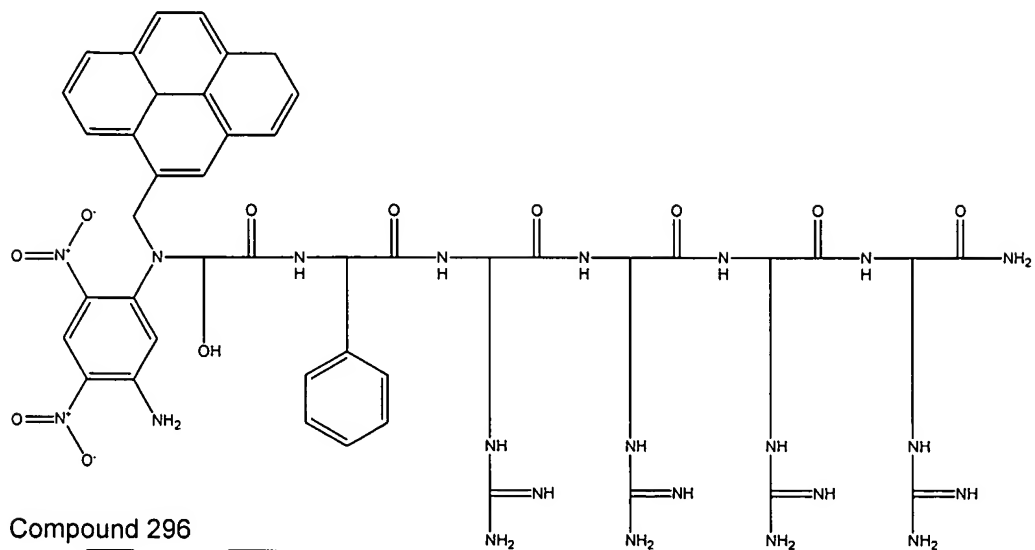
Compound 292



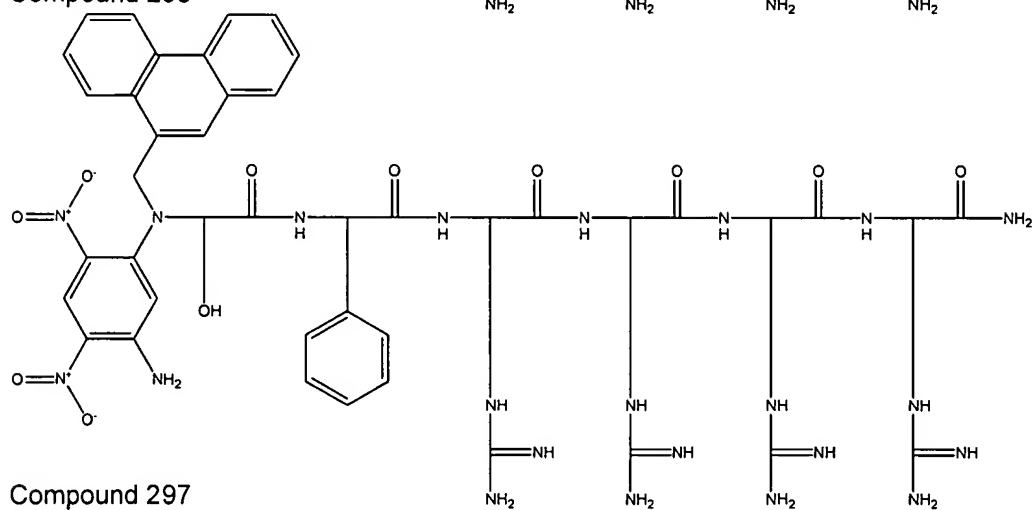
Compound 293

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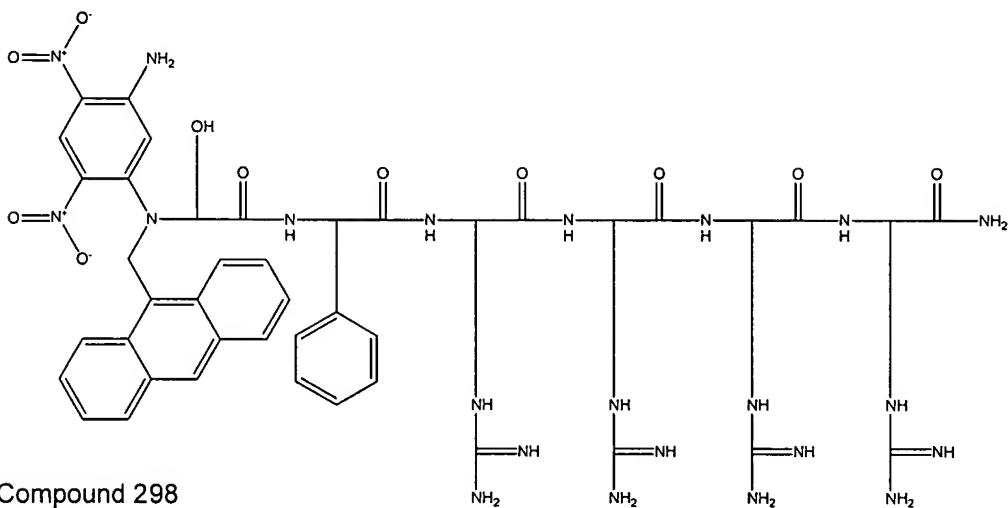




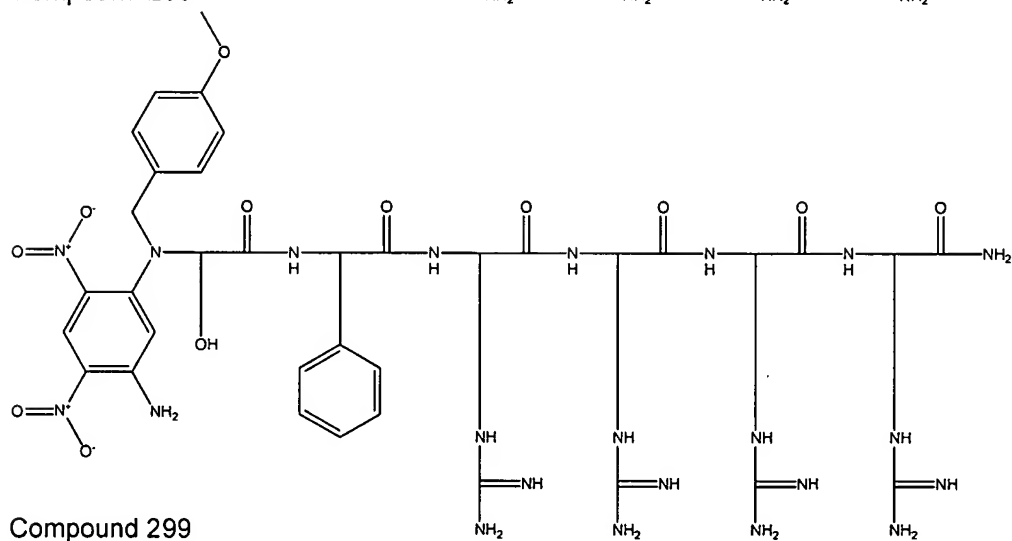
Compound 296



Compound 297

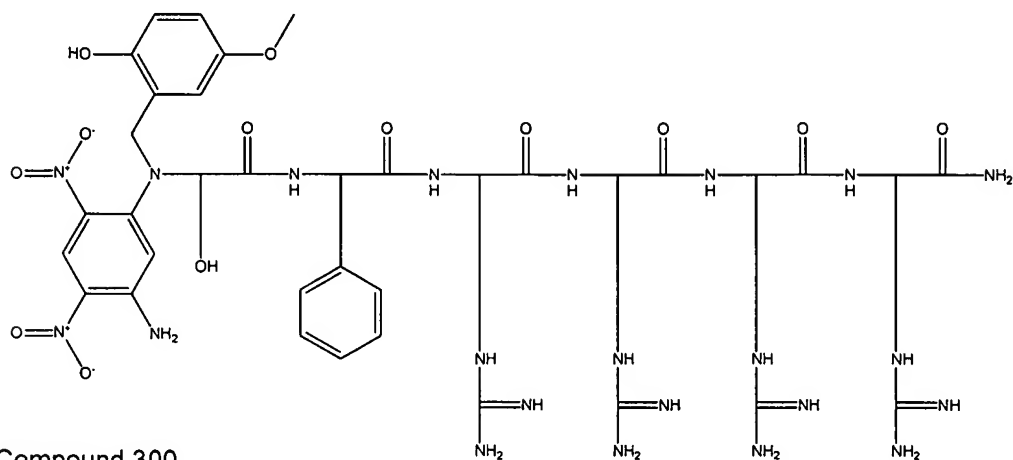


Compound 298

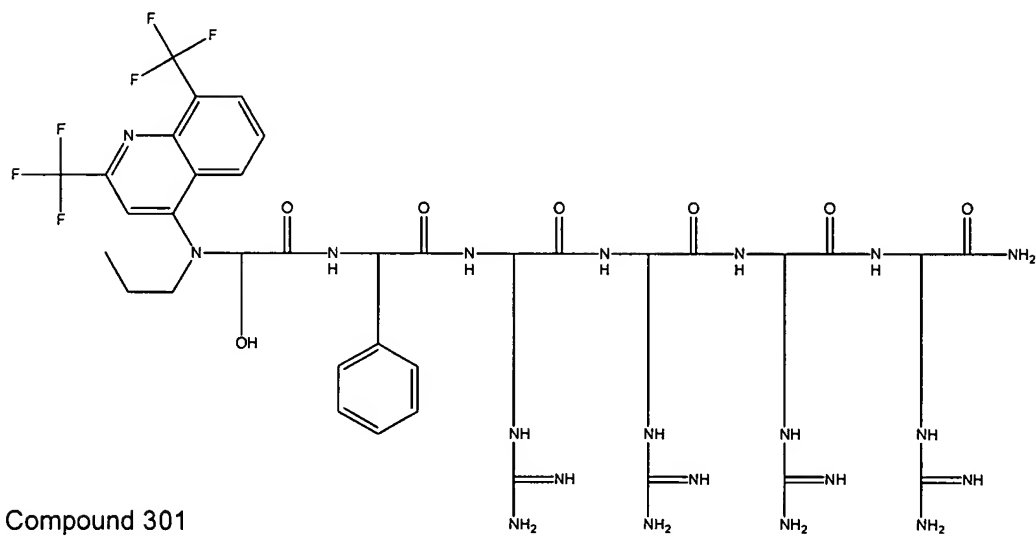


Compound 299

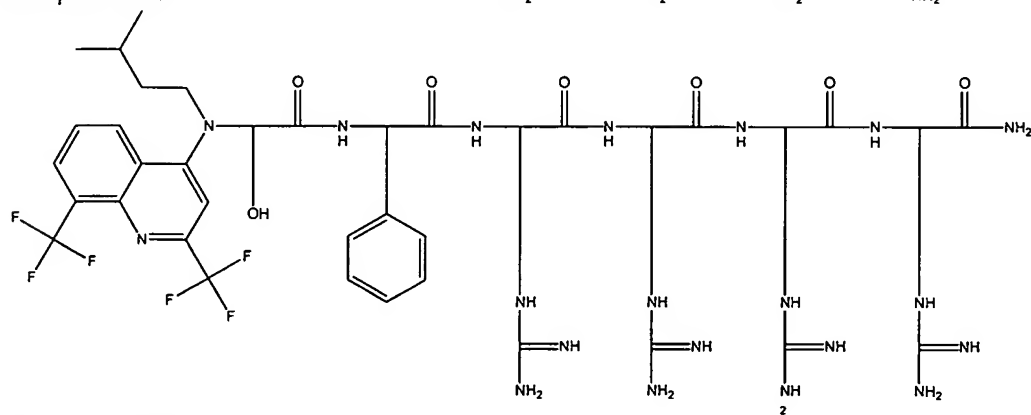




Compound 300

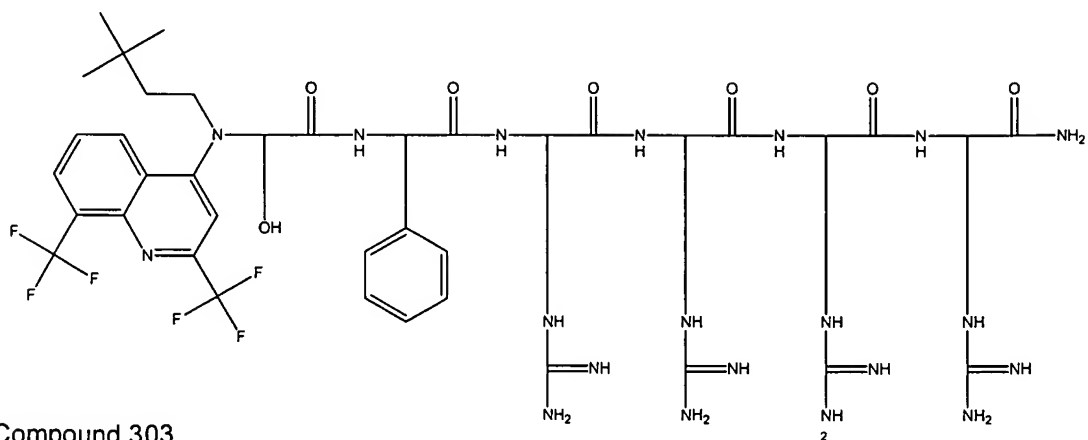


Compound 301

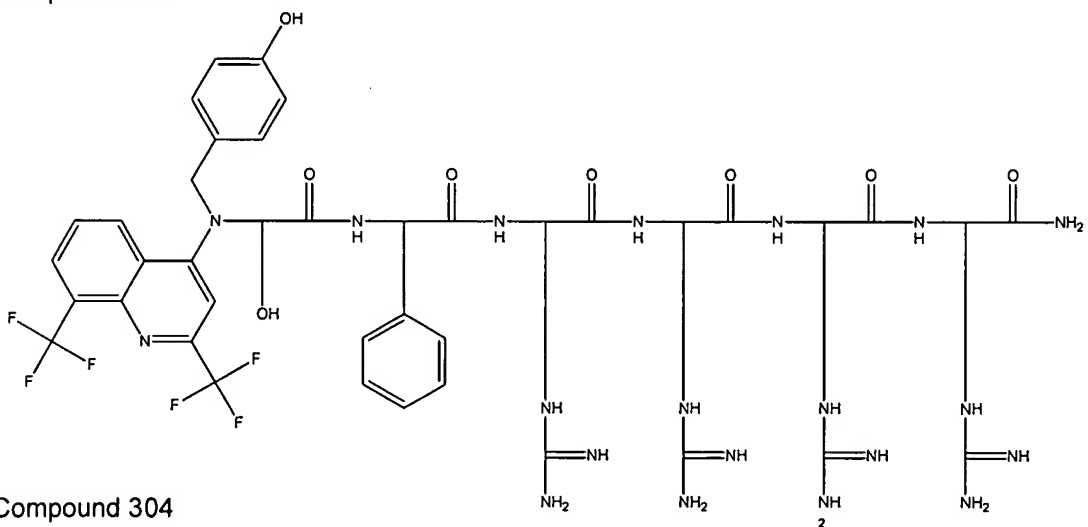


Compound 302

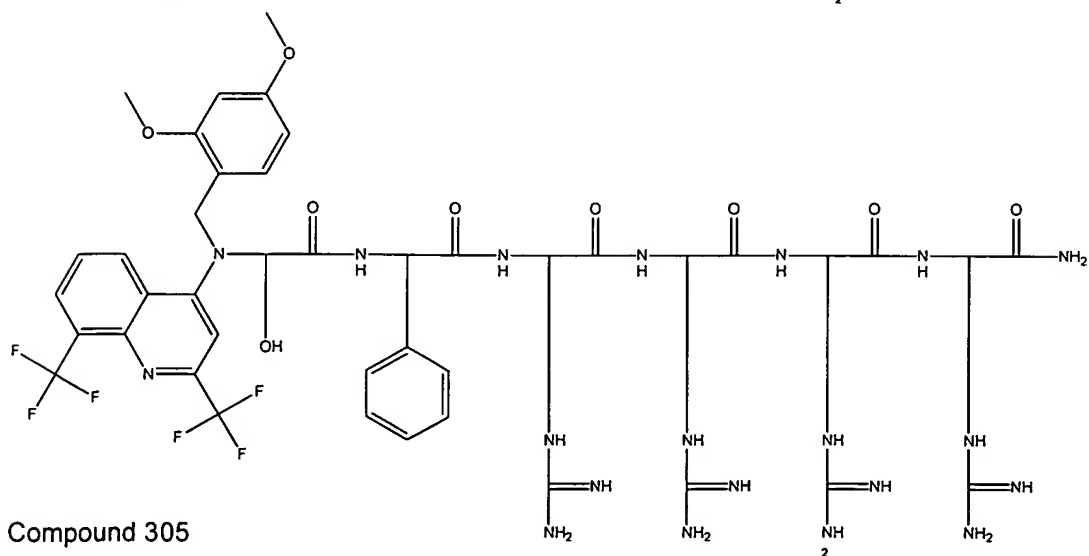
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Compound 303

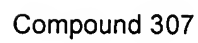


Compound 304

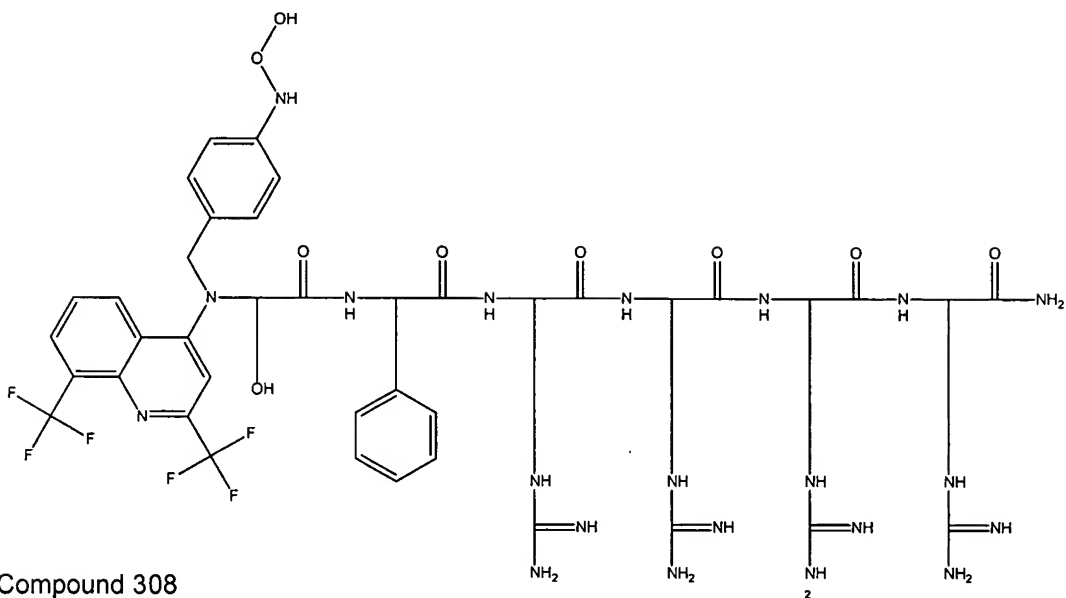


Compound 305

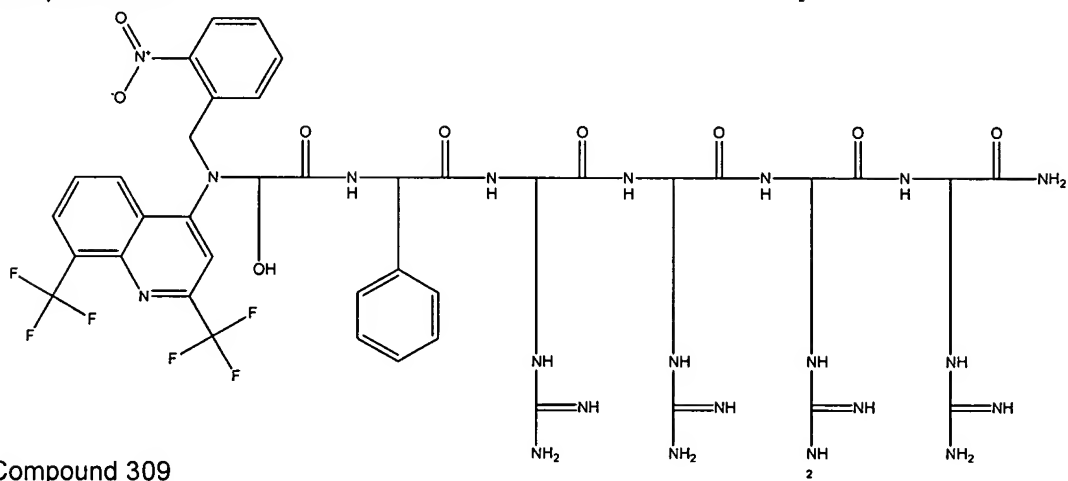
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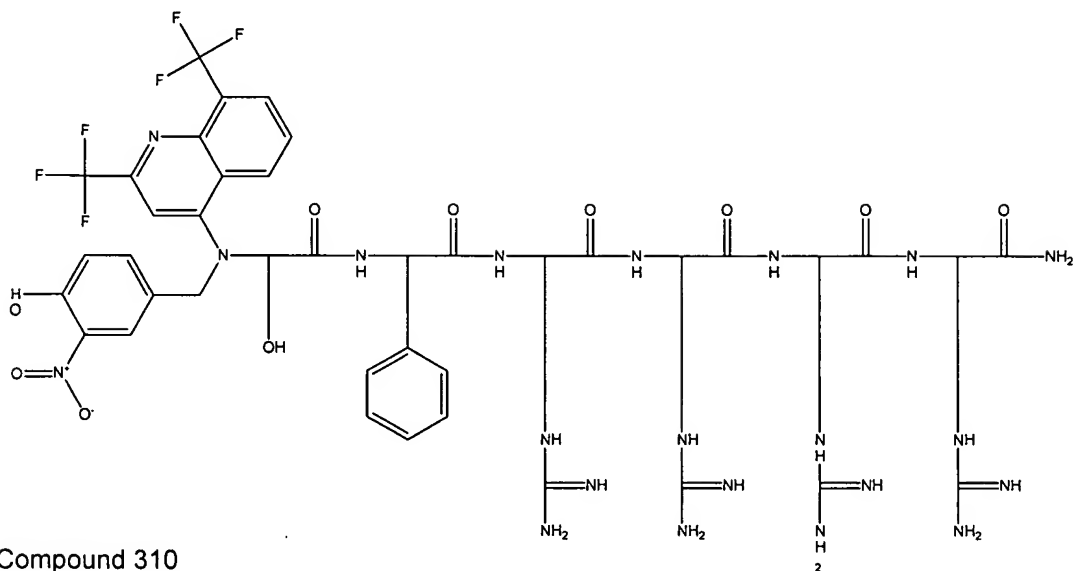


### Compound 308

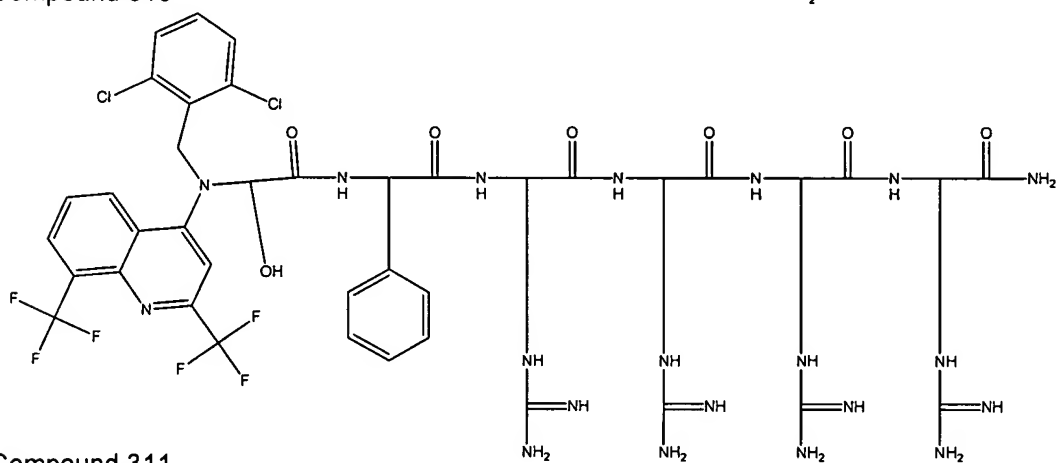


Compound 309

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Compound 310



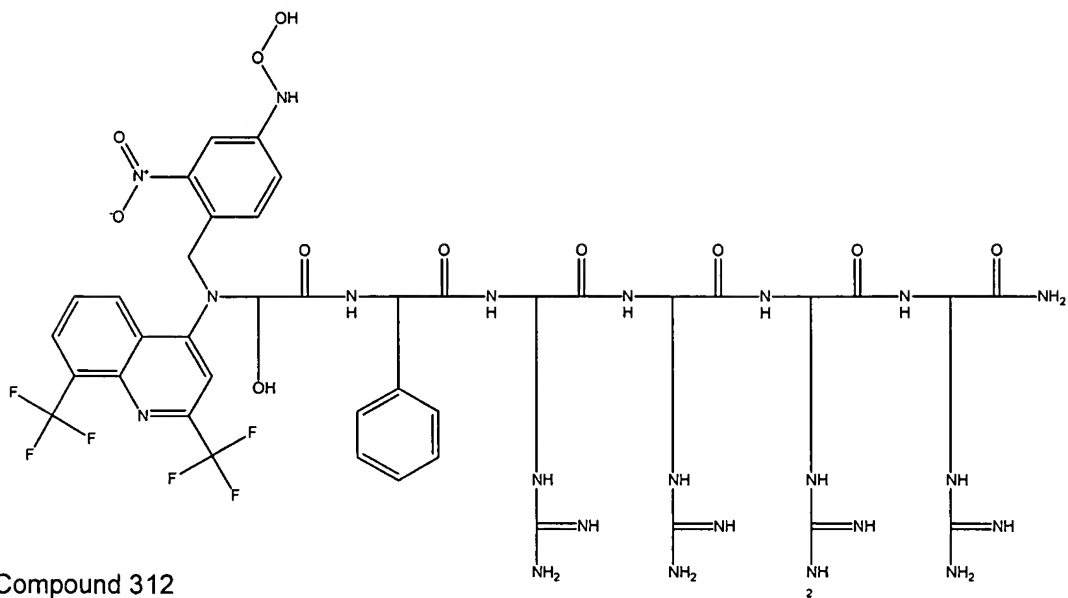
Compound 311

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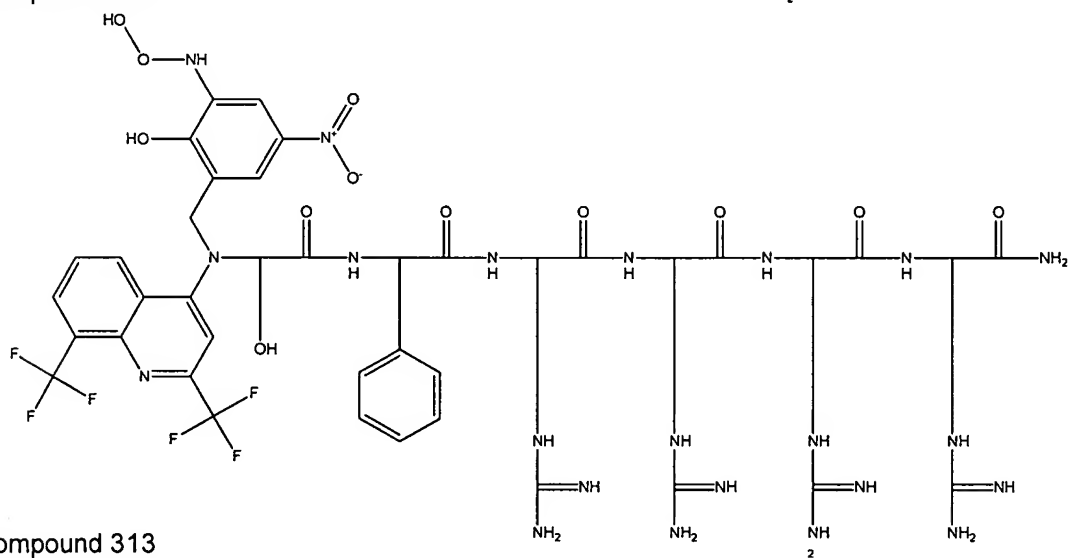
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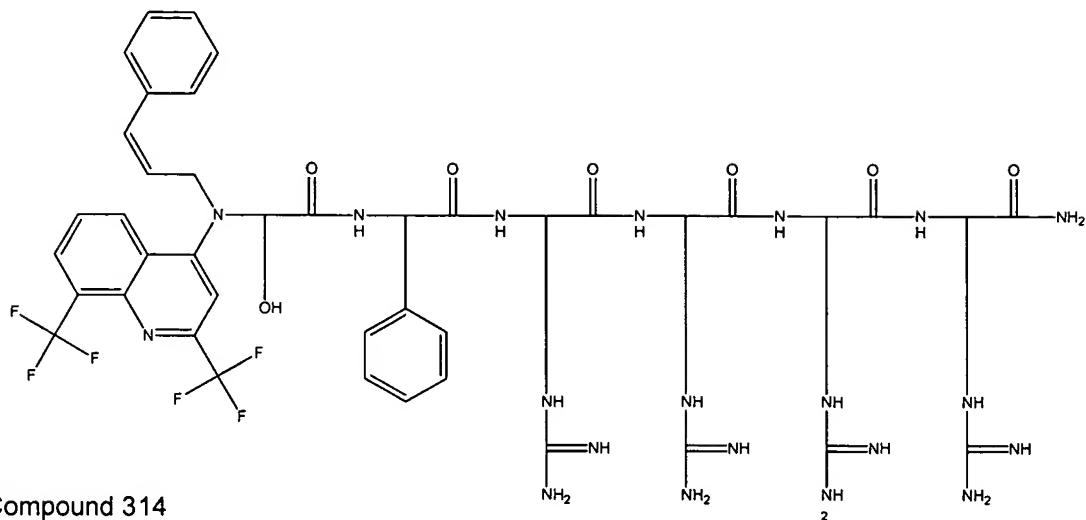
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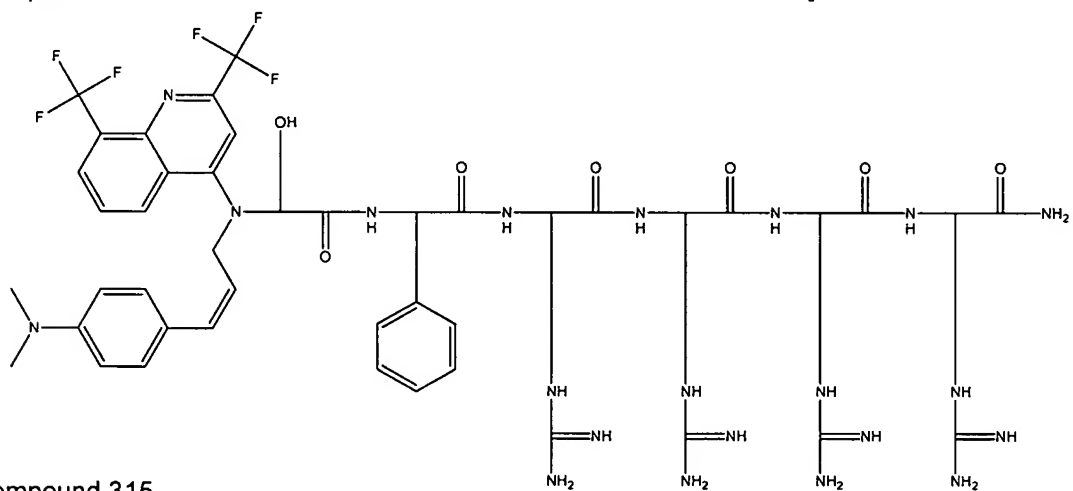
Compound 312



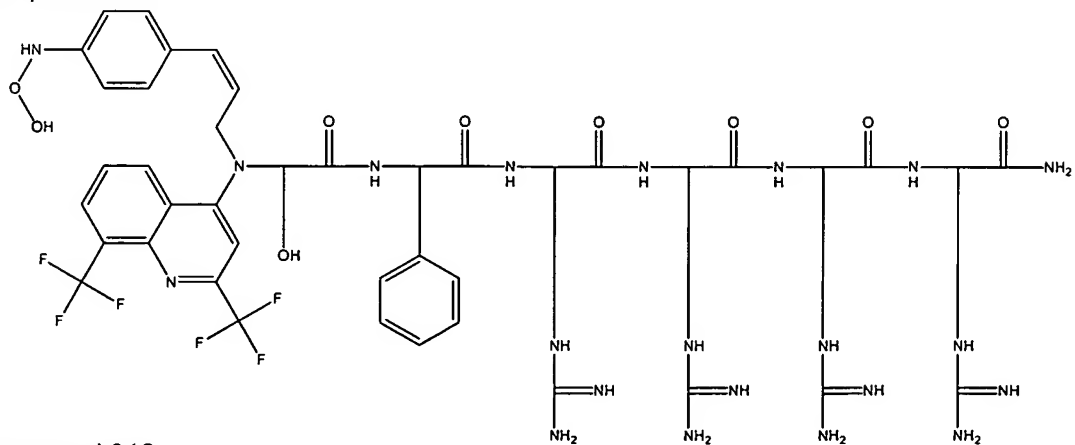
Compound 313



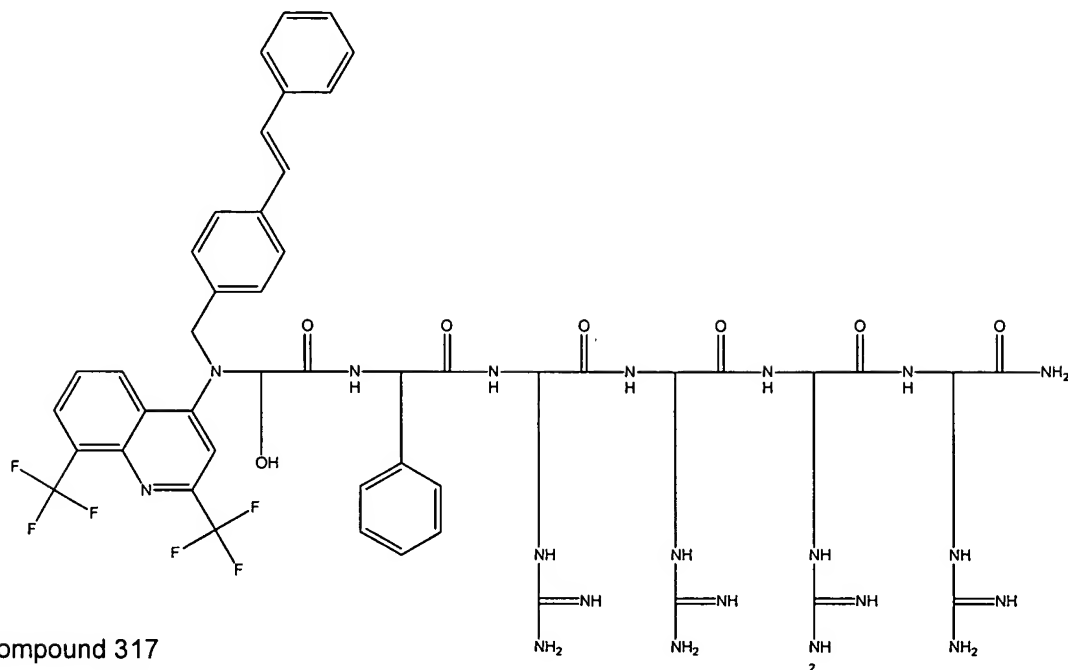
Compound 314



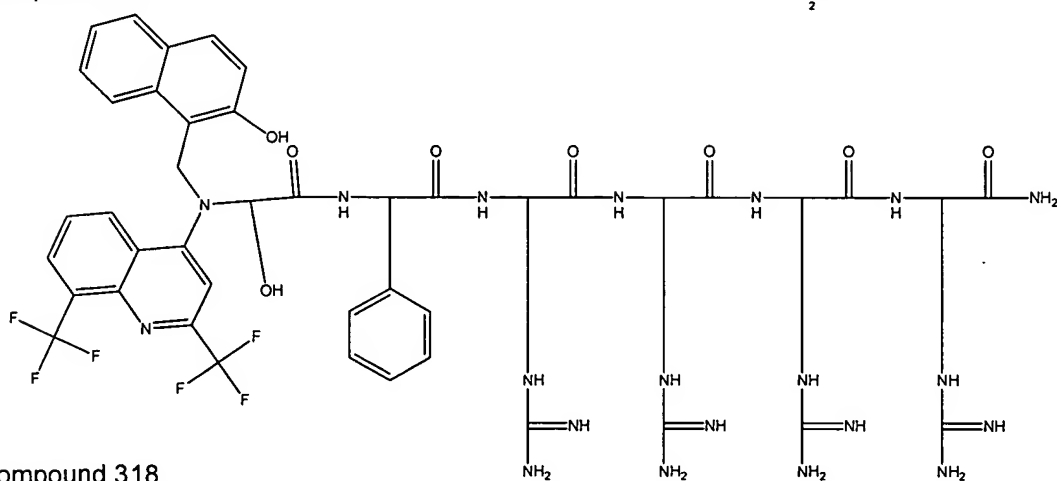
Compound 315



Compound 316



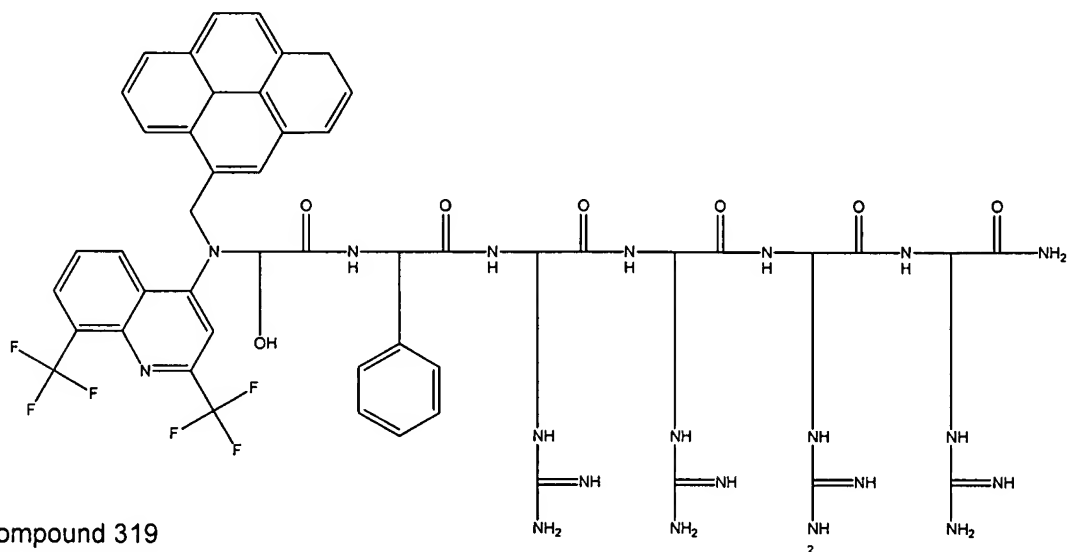
Compound 317



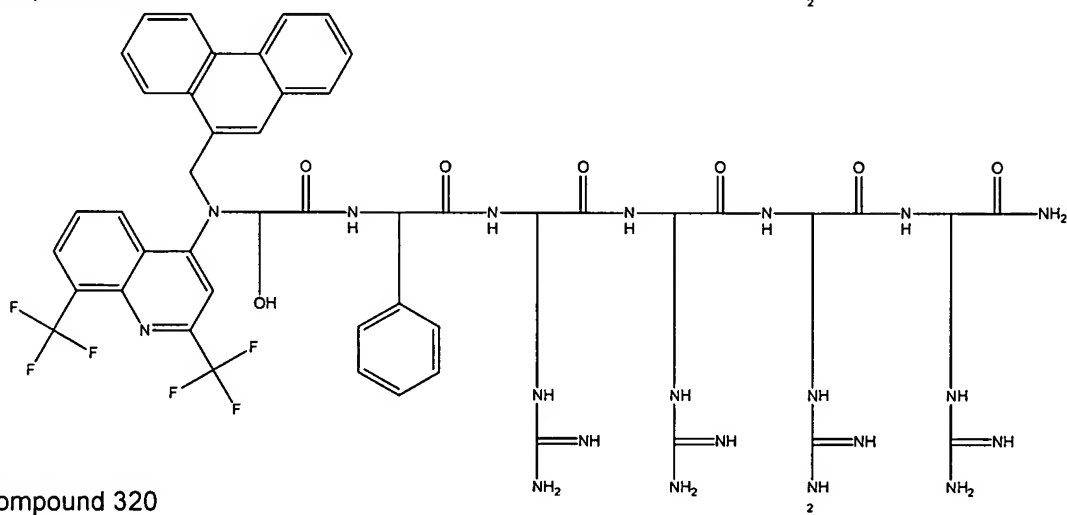
Compound 318



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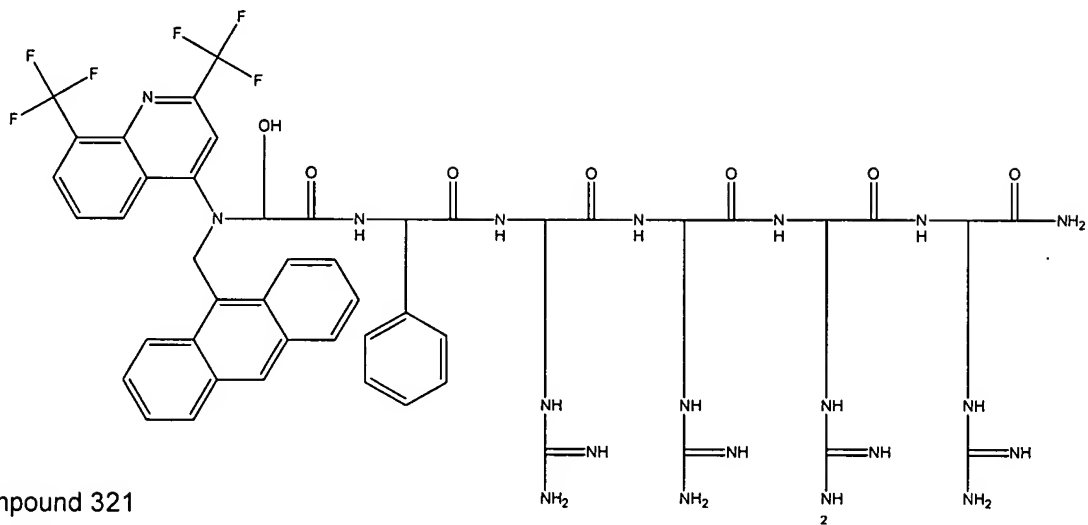


Compound 319

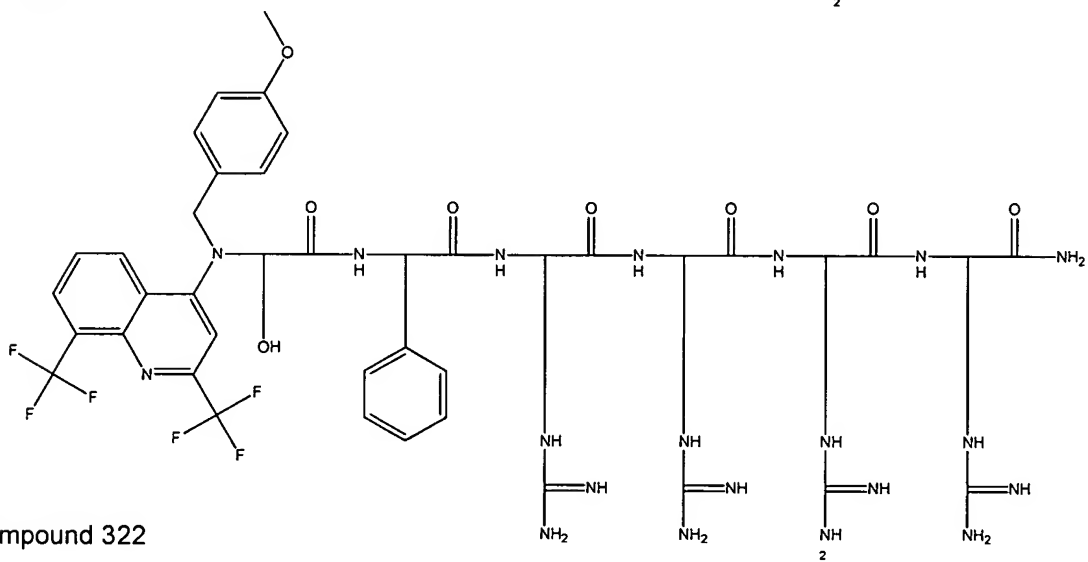


Compound 320

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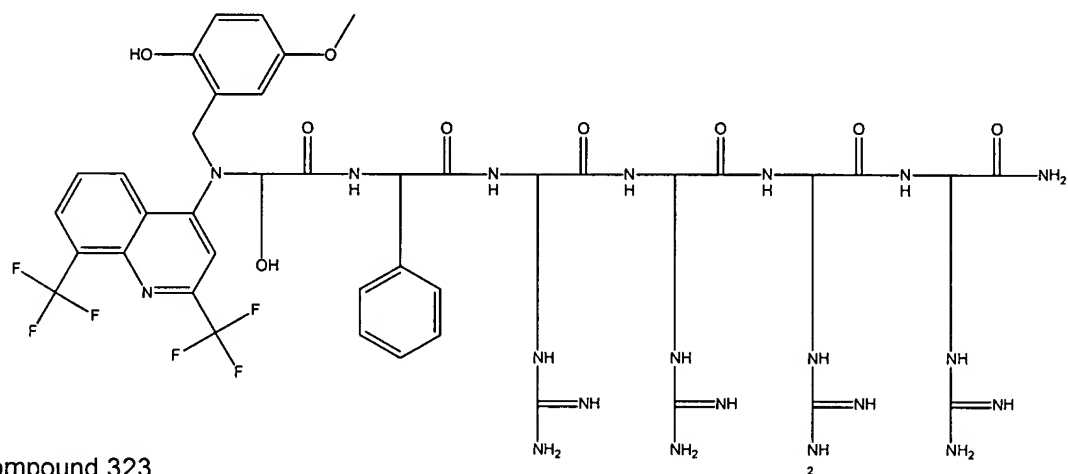


Compound 321

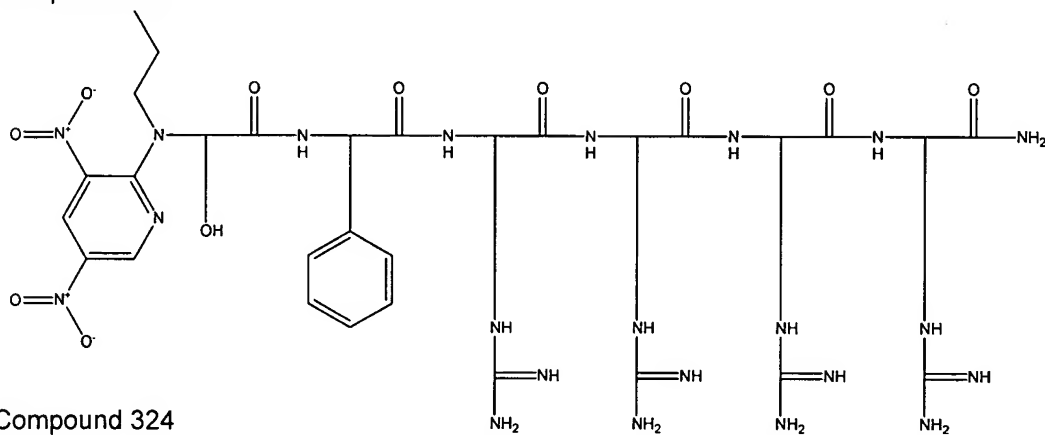


Compound 322

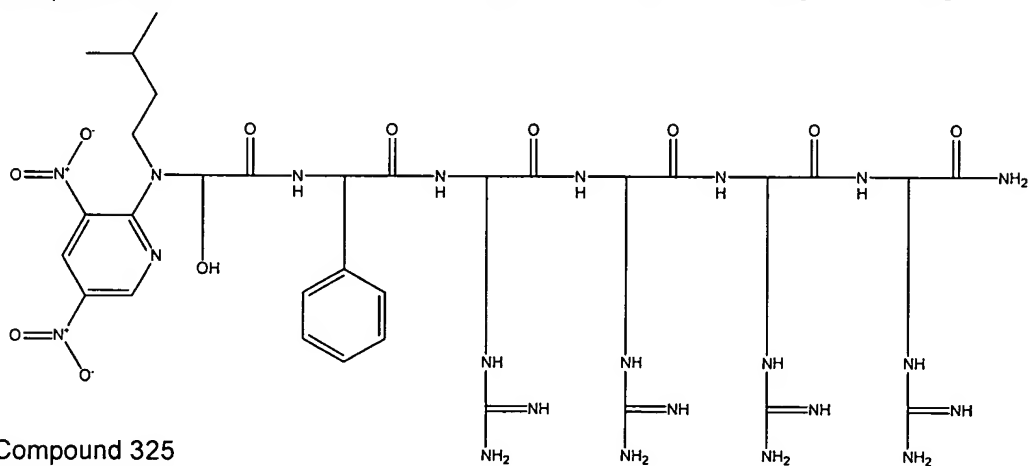
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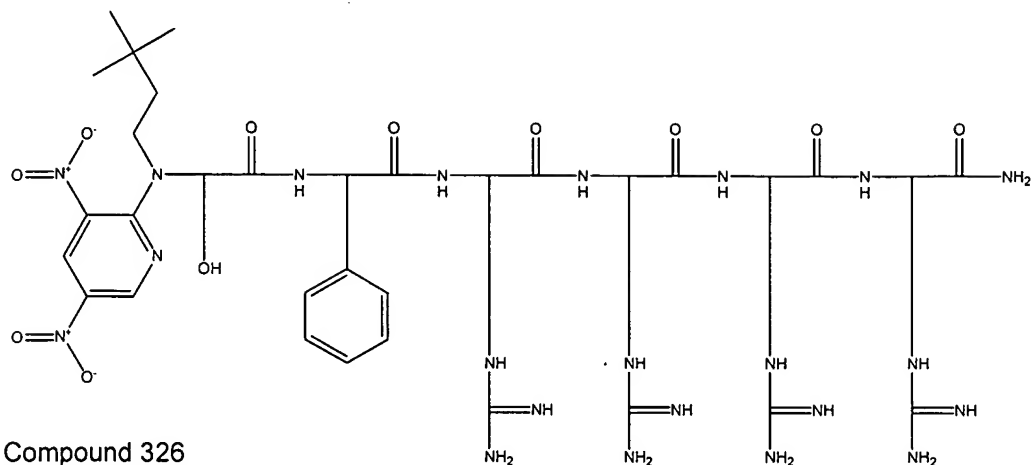
Compound 323



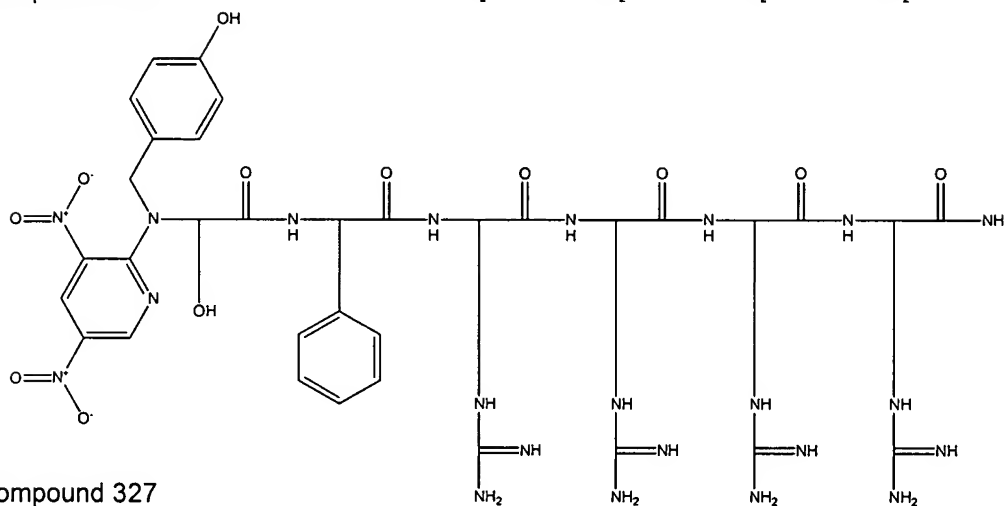
Compound 324



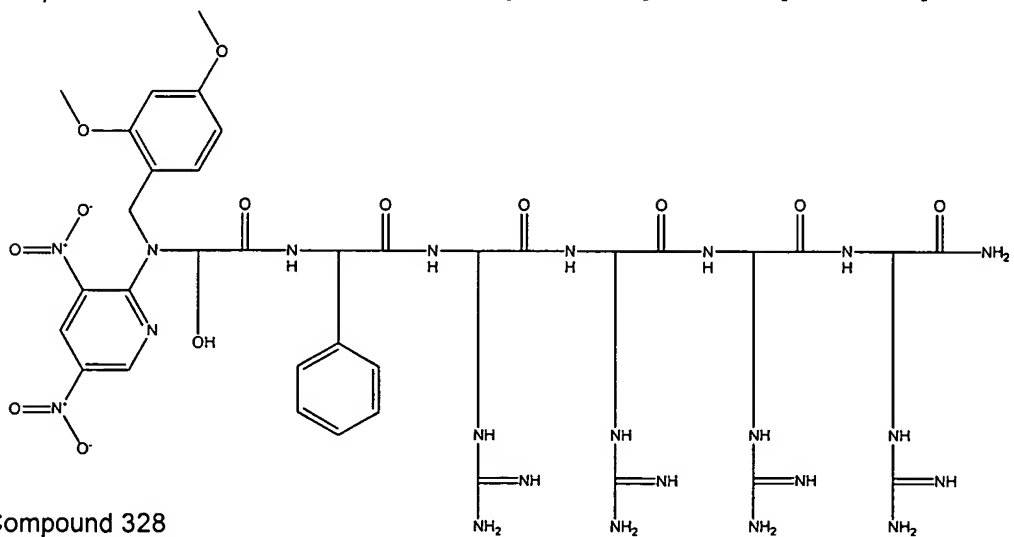
Compound 325



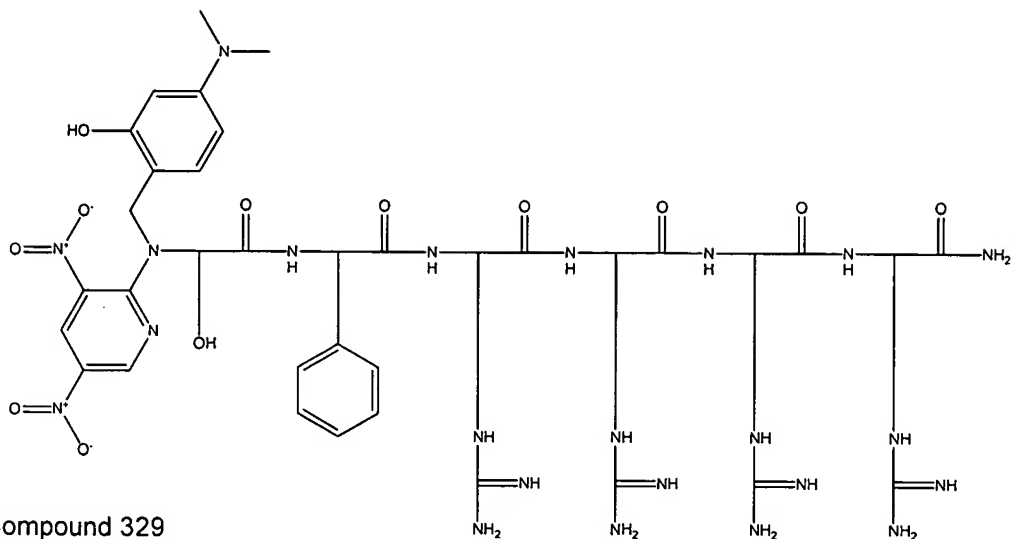
Compound 326



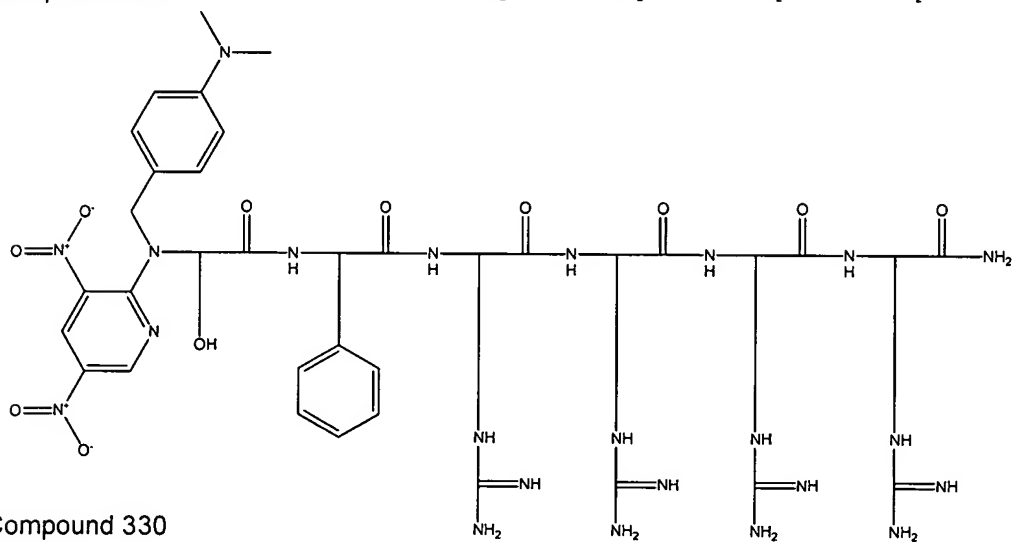
Compound 327



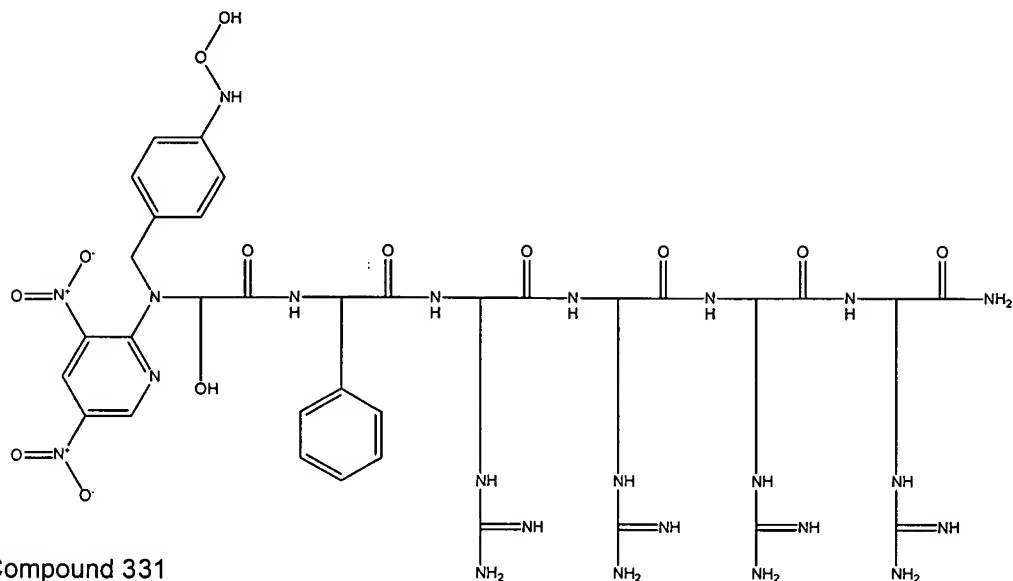
Compound 328



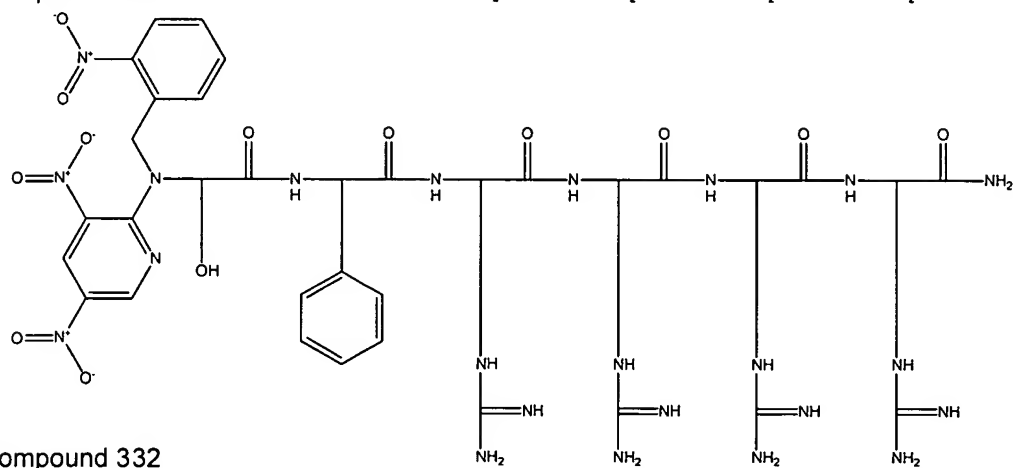
Compound 329



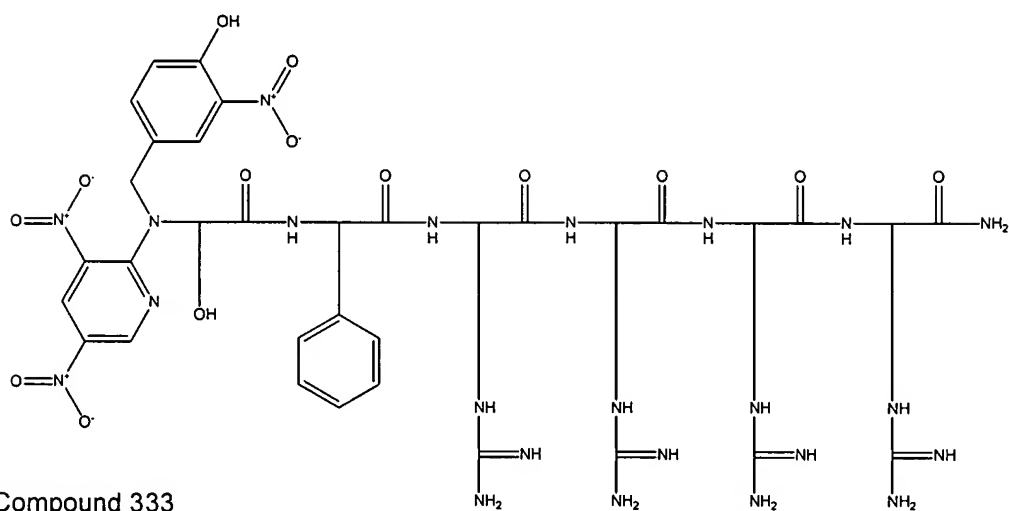
Compound 330



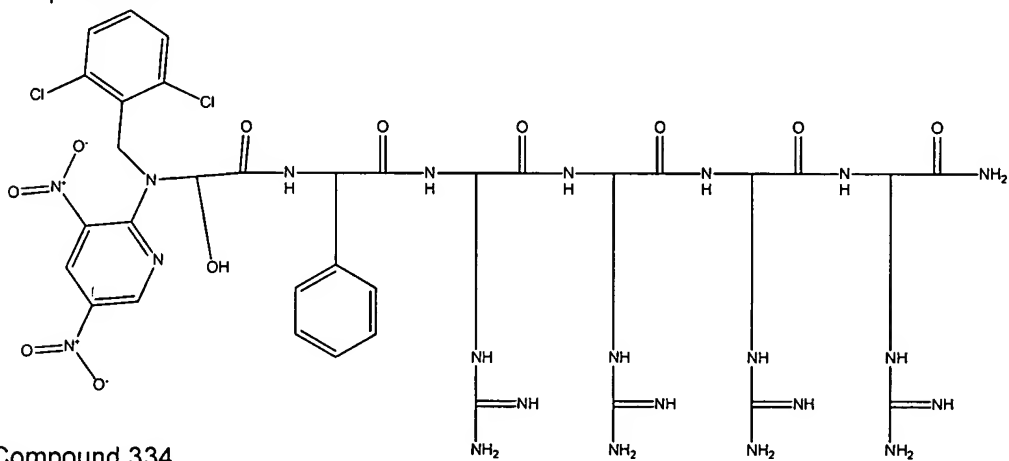
Compound 331



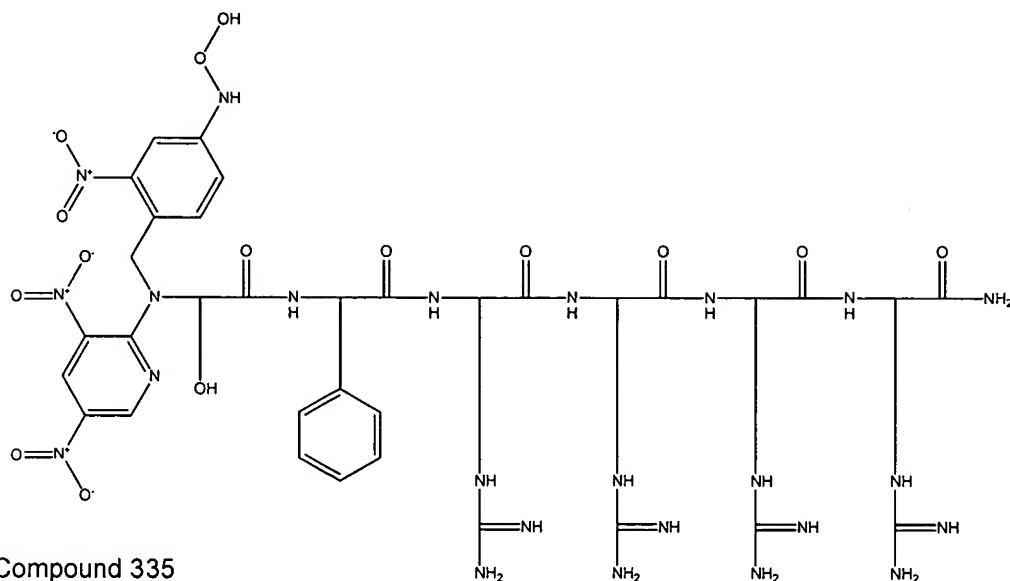
Compound 332



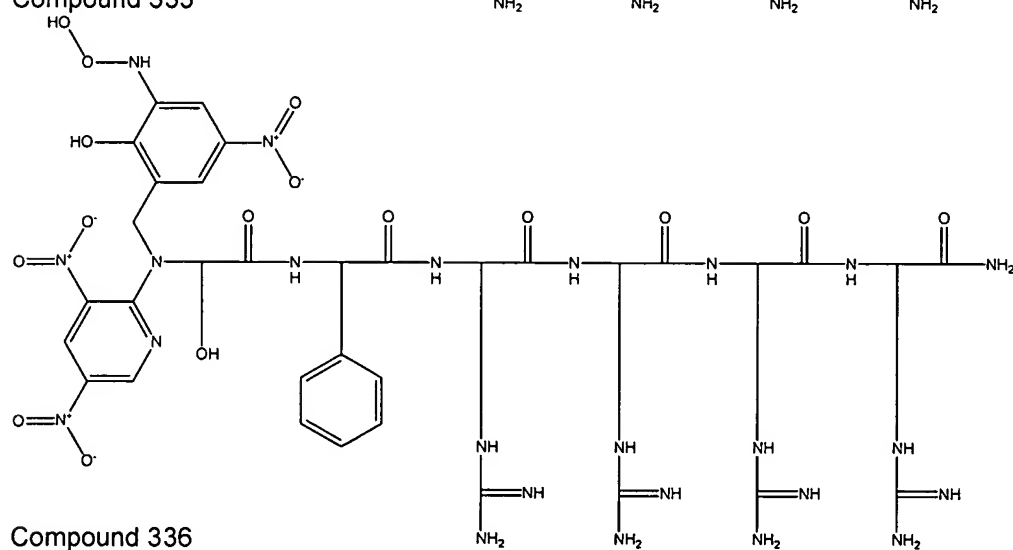
Compound 333



Compound 334

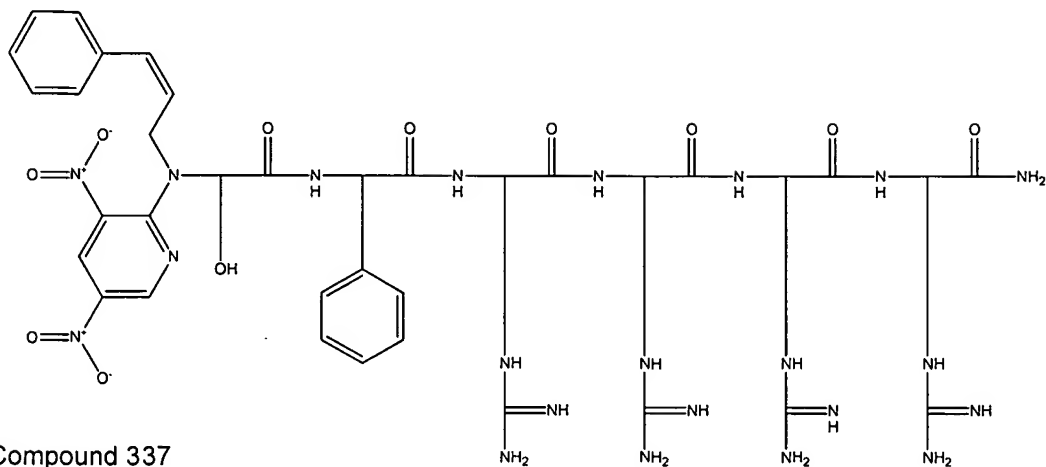


Compound 335

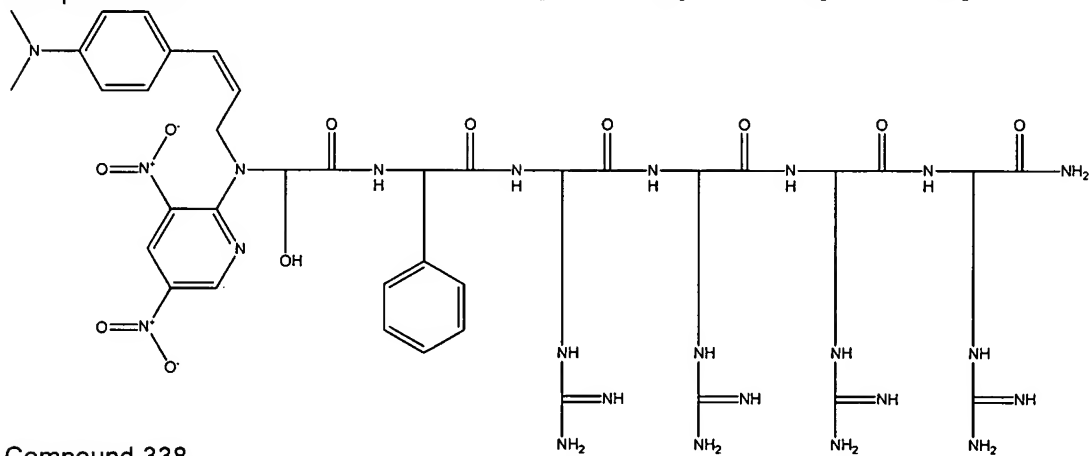


Compound 336

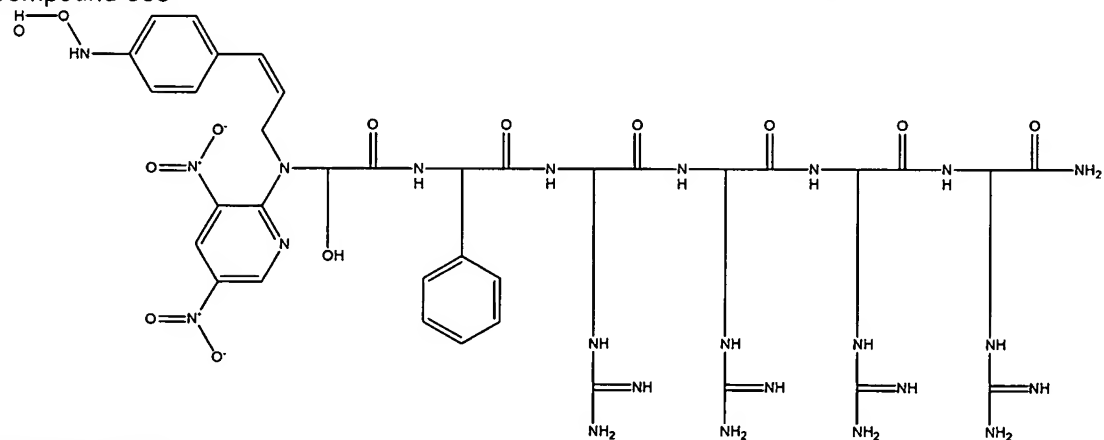




Compound 337

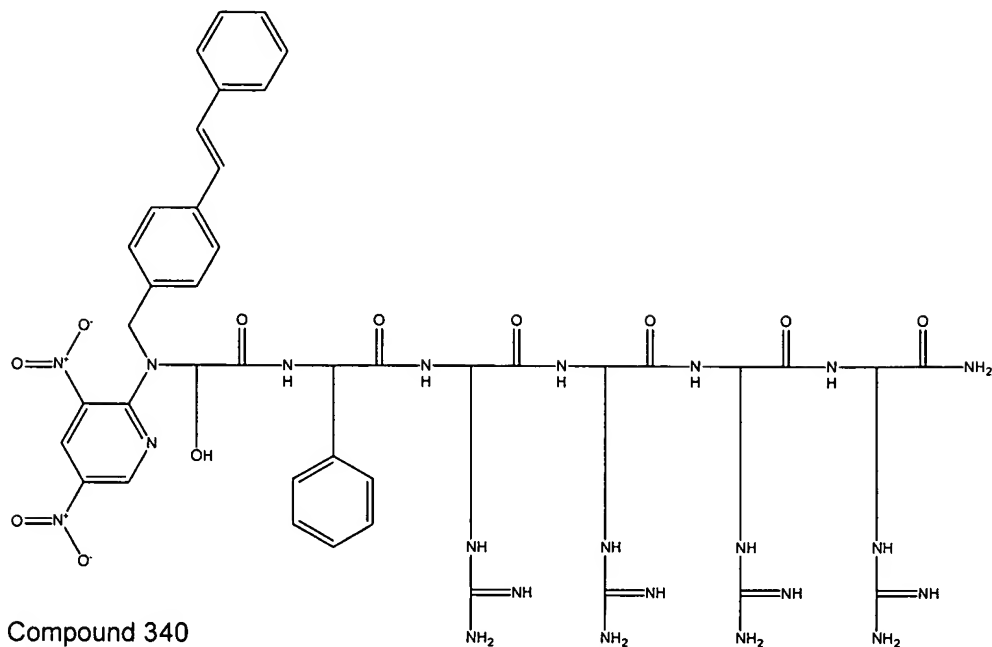


Compound 338

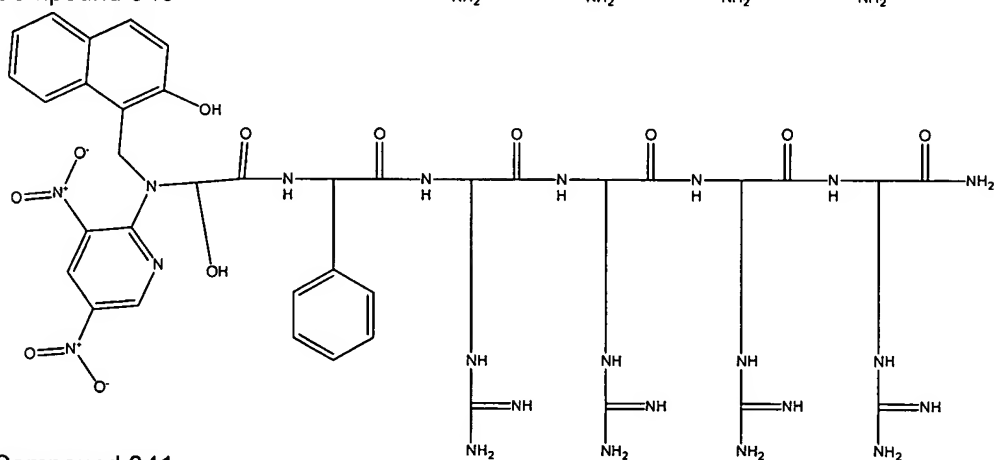


Compound 339

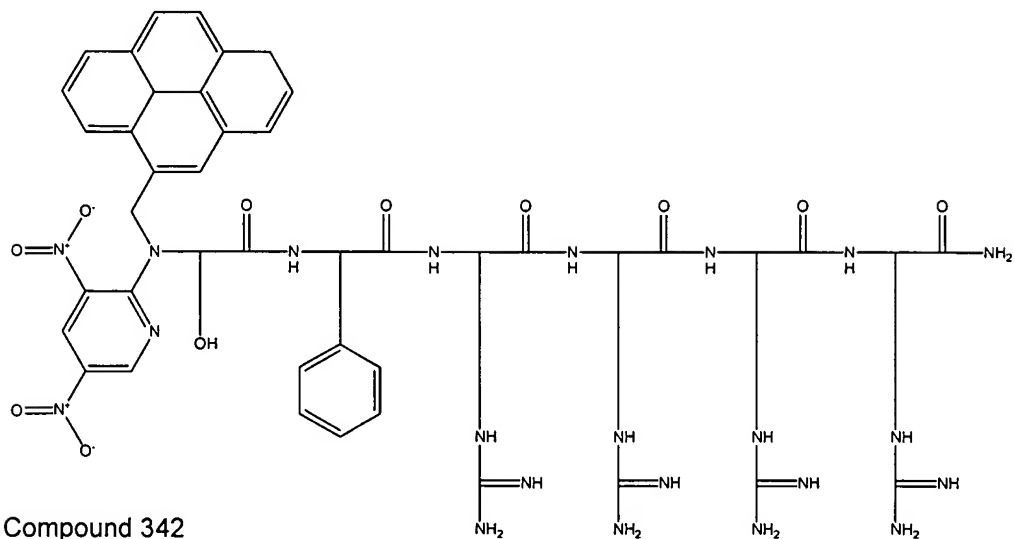
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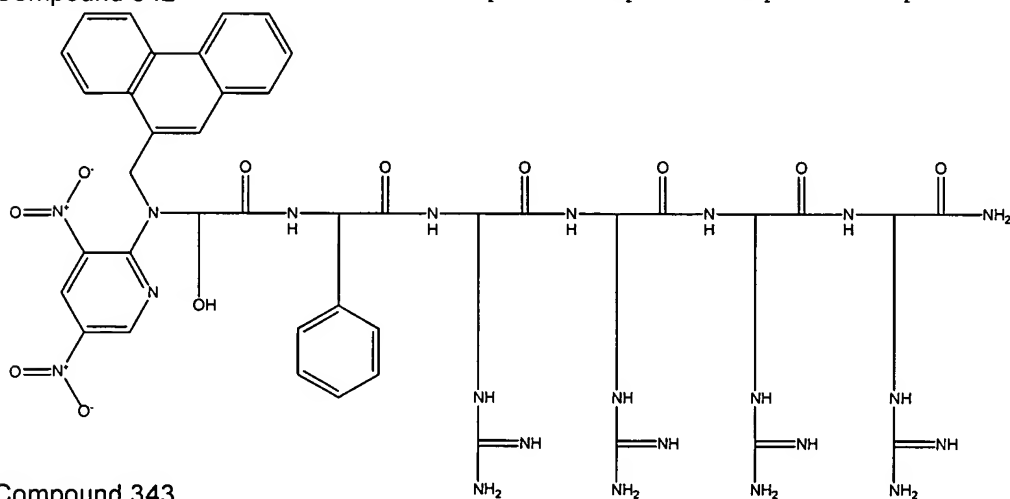
Compound 340



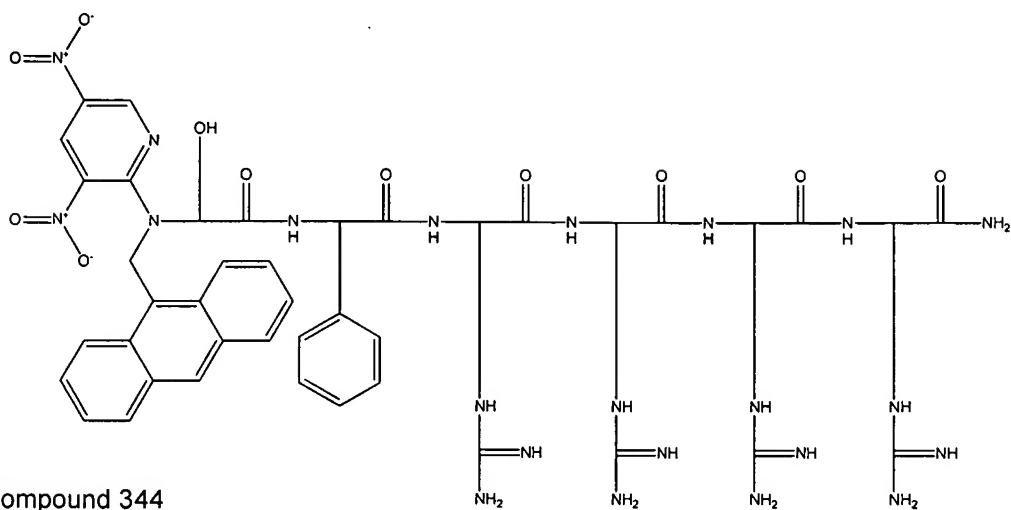
Compound 341



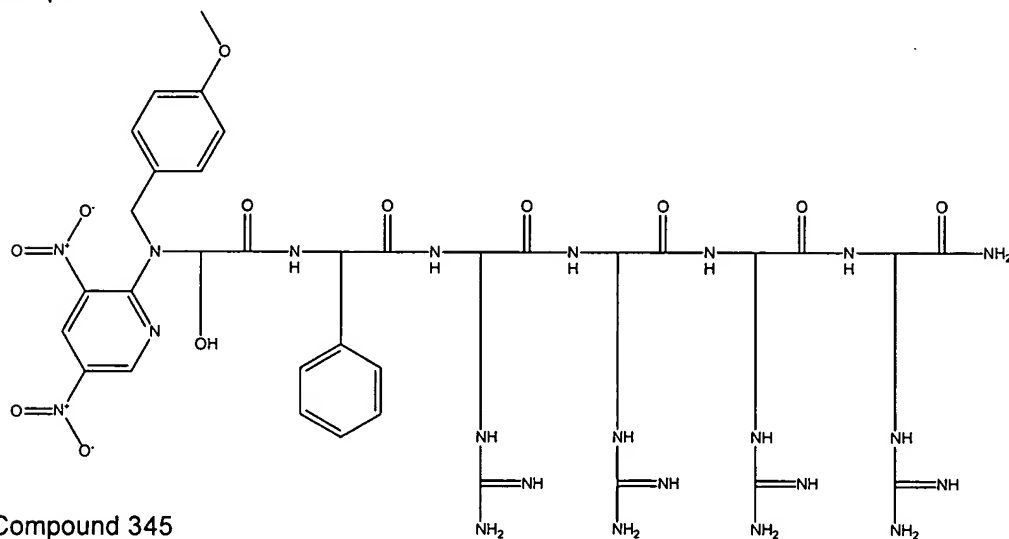
Compound 342



Compound 343



Compound 344



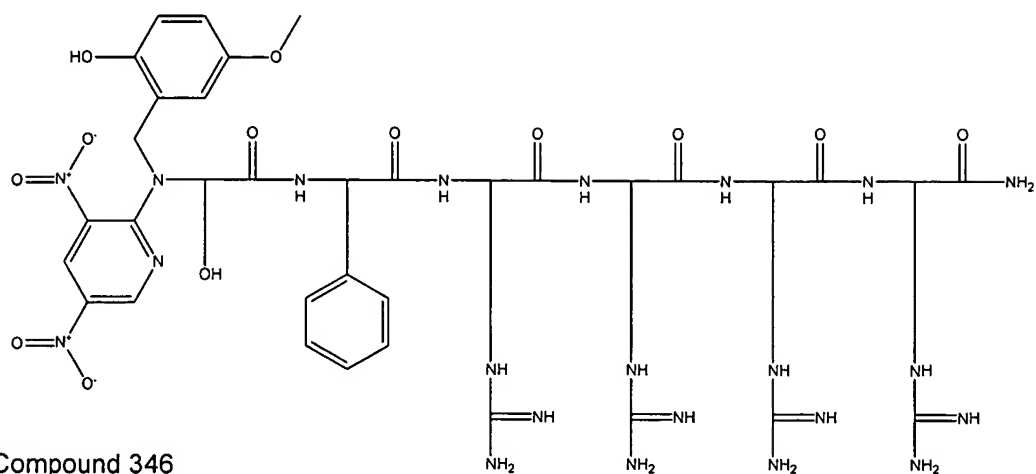
Compound 345

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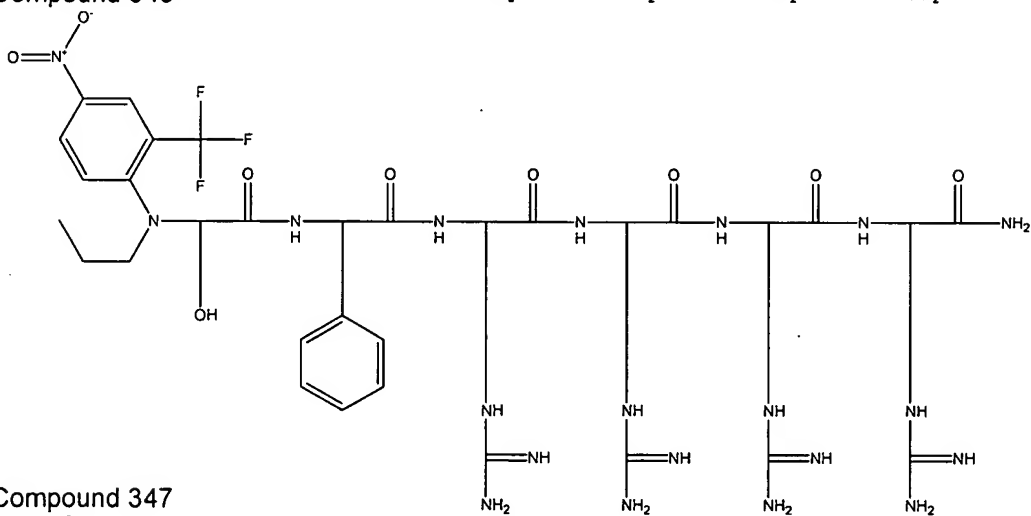
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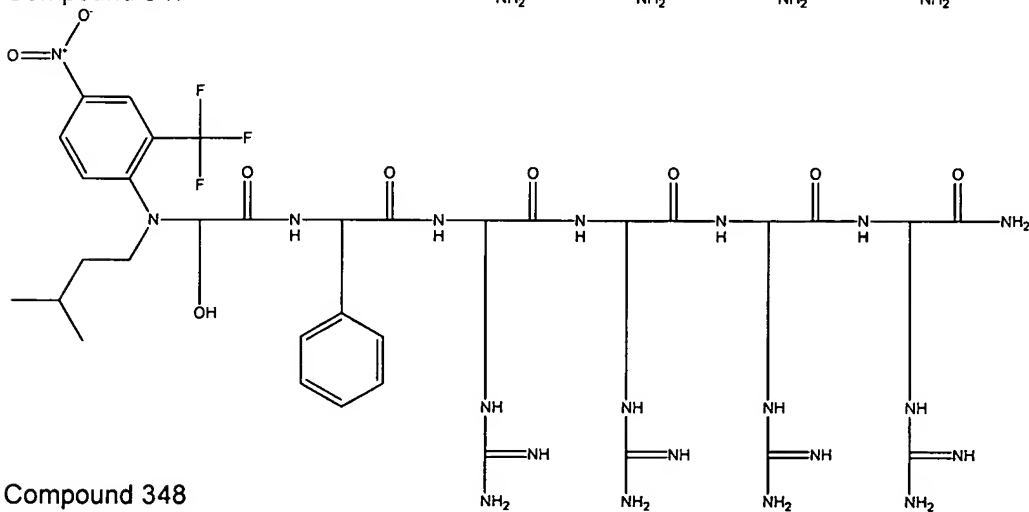
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Compound 346

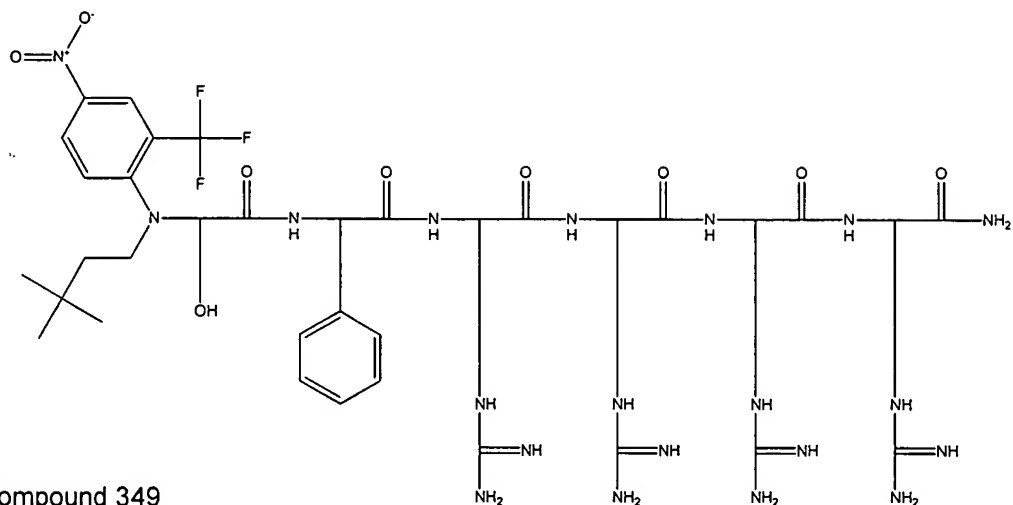


Compound 347

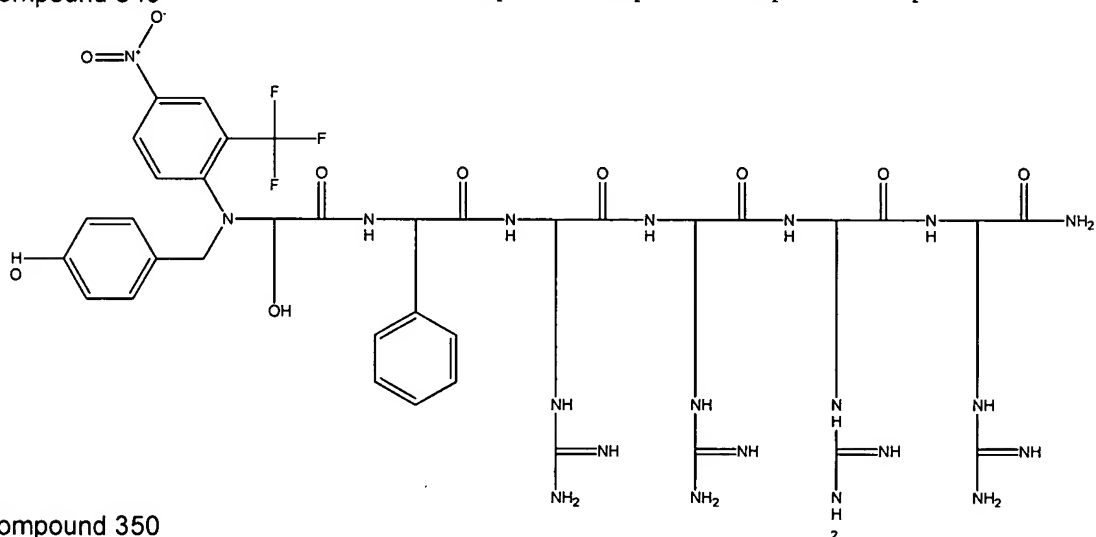


Compound 348

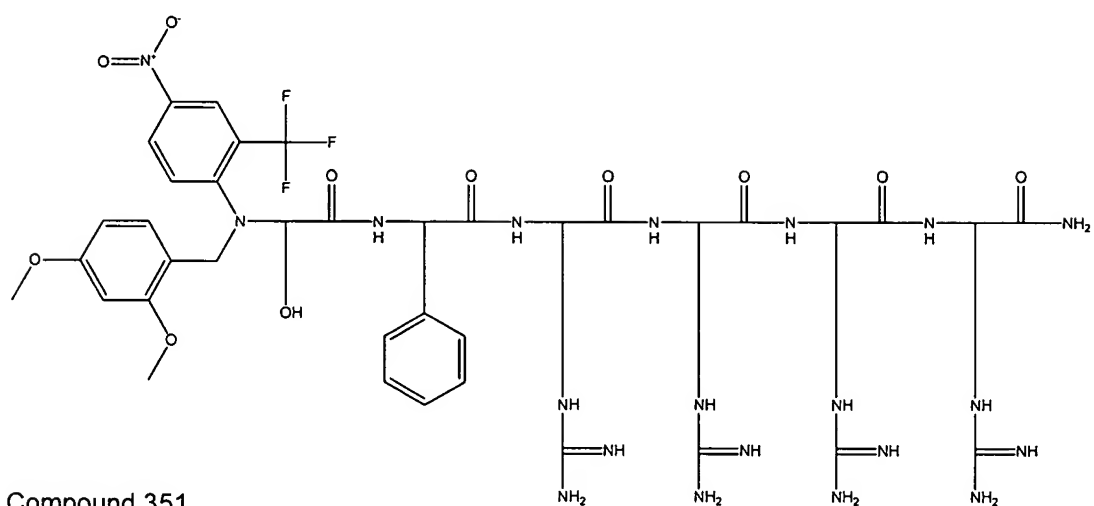
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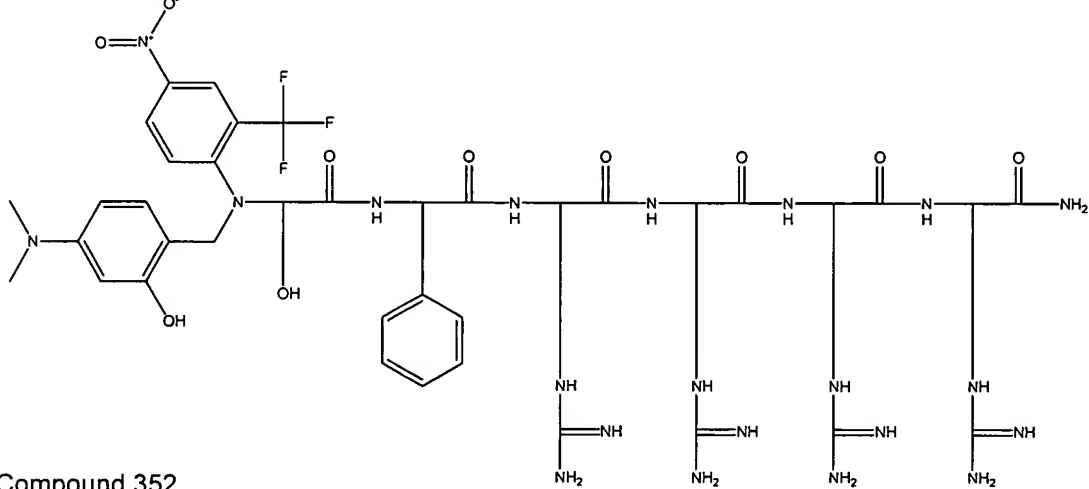
Compound 349



Compound 350

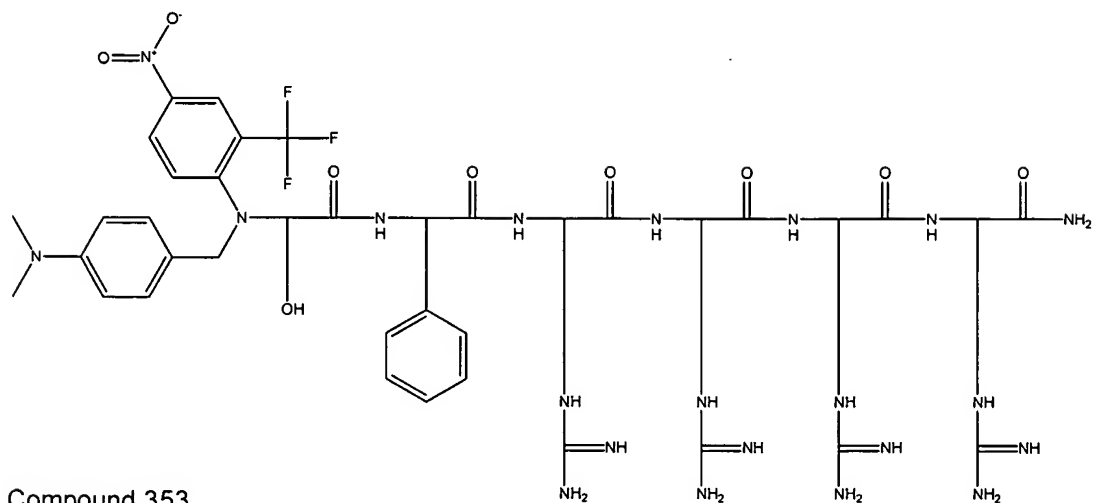


Compound 351

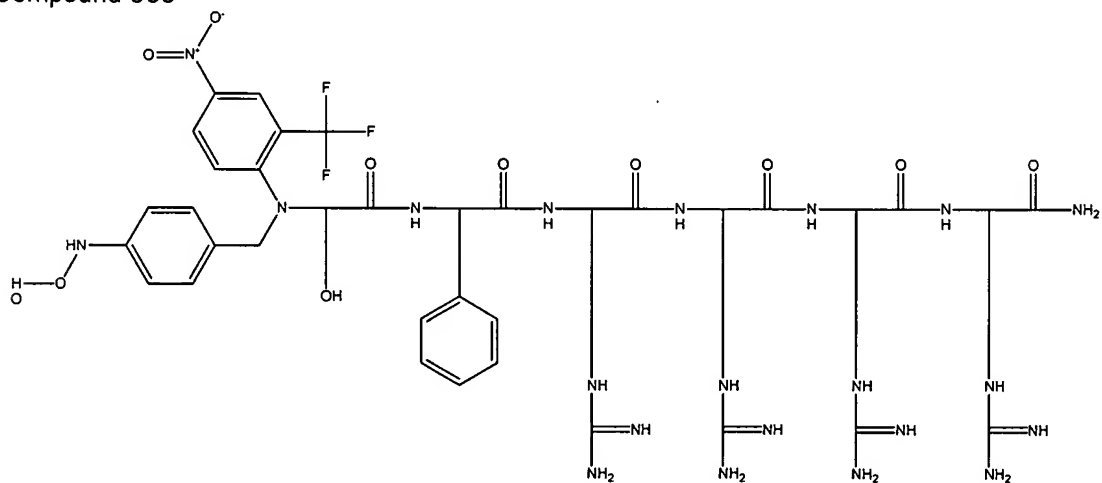


Compound 352

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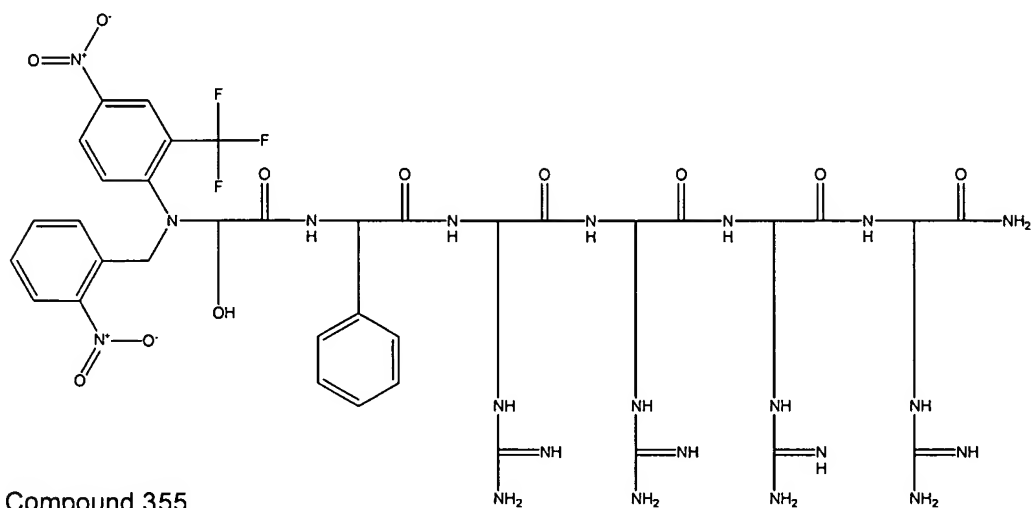
Compound 353



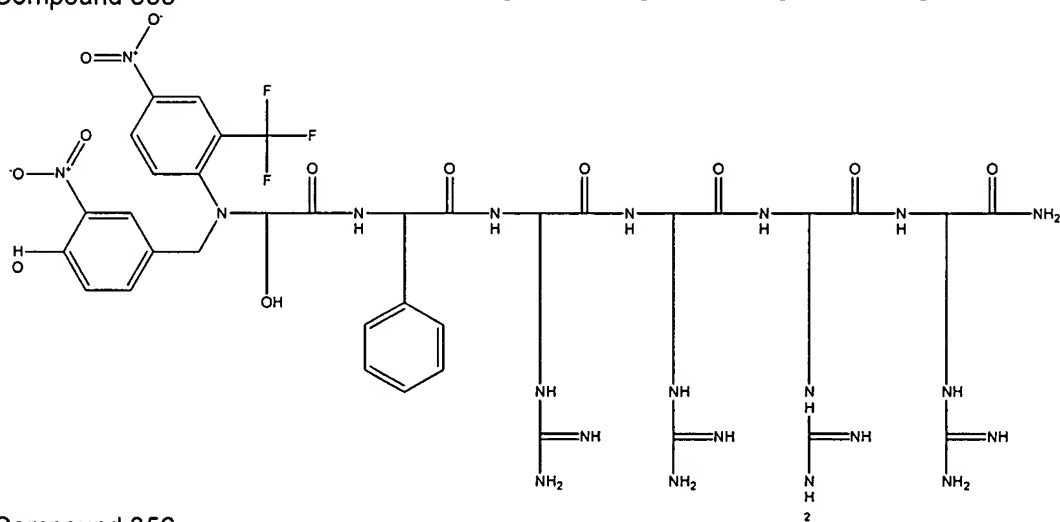
Compound 354



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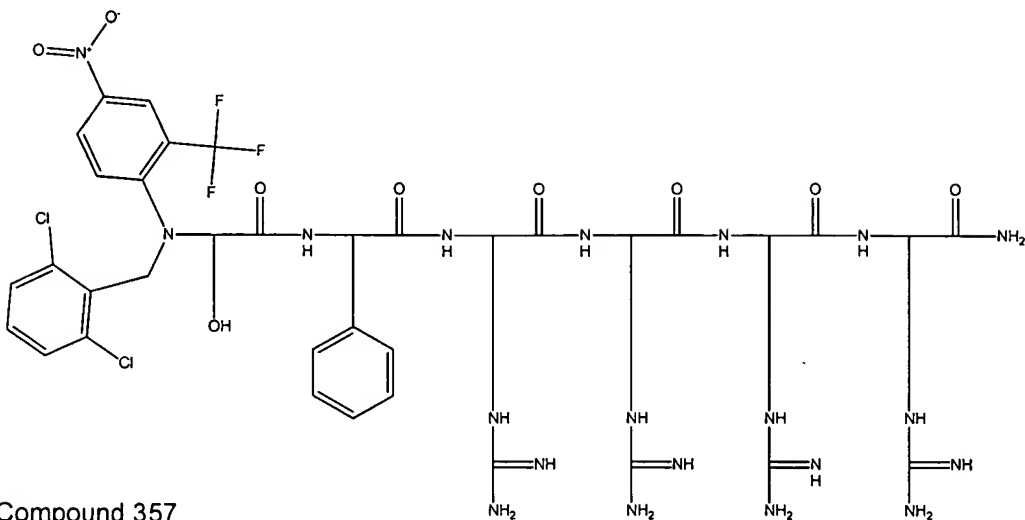


Compound 355

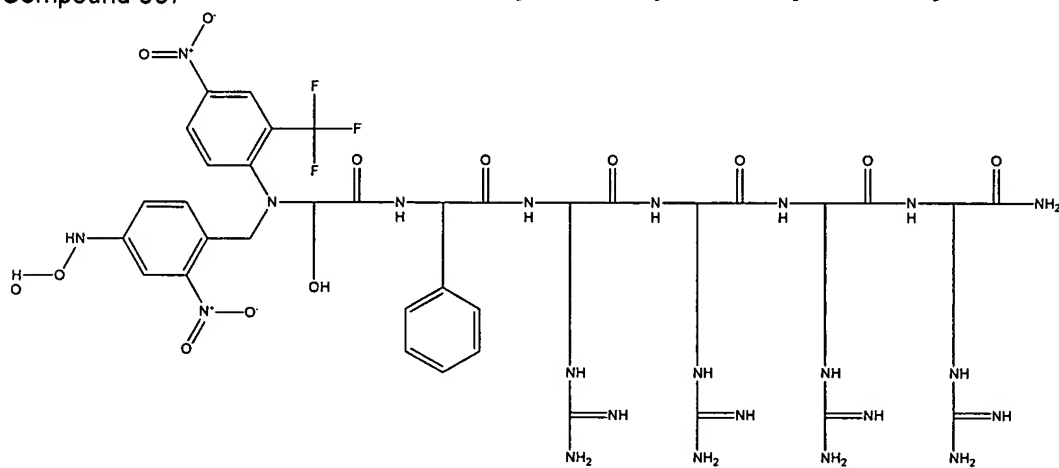


Compound 356

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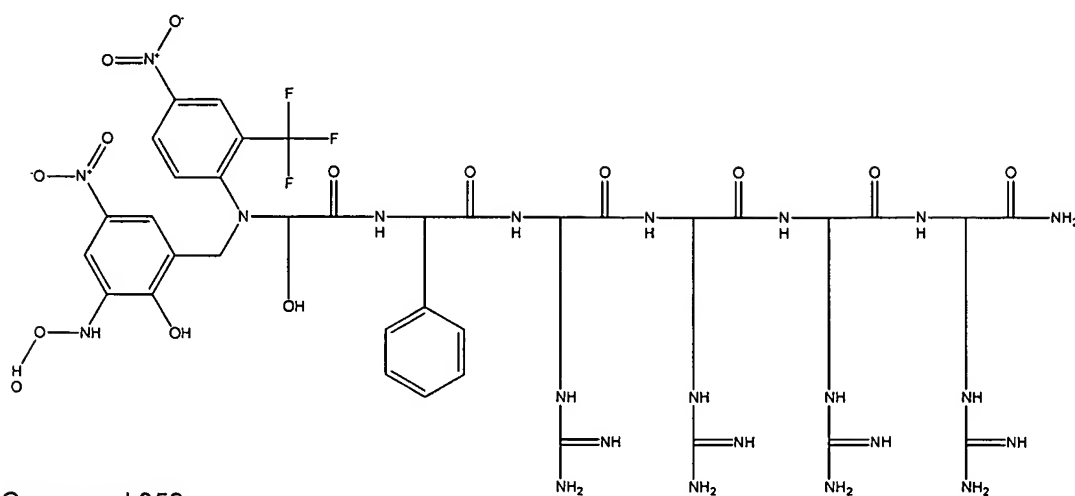


Compound 357

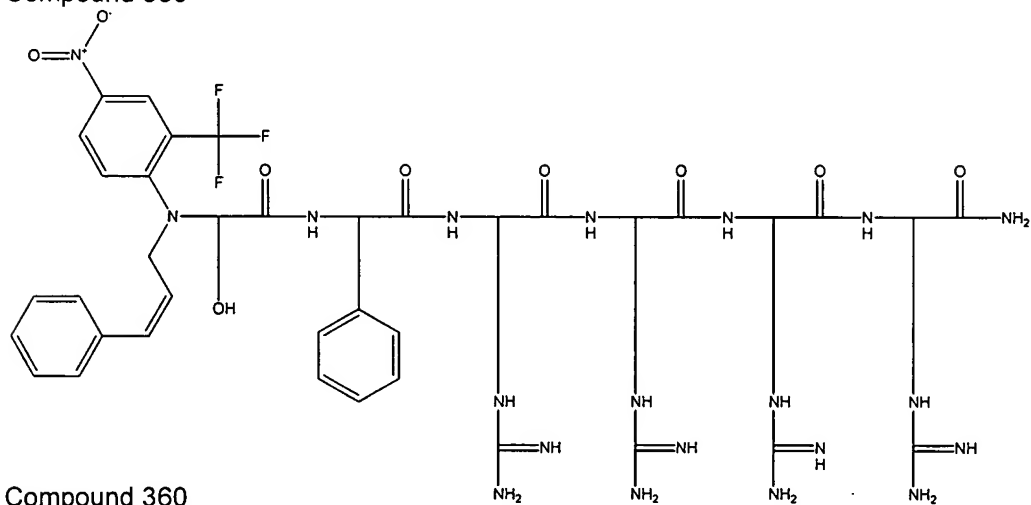


Compound 358

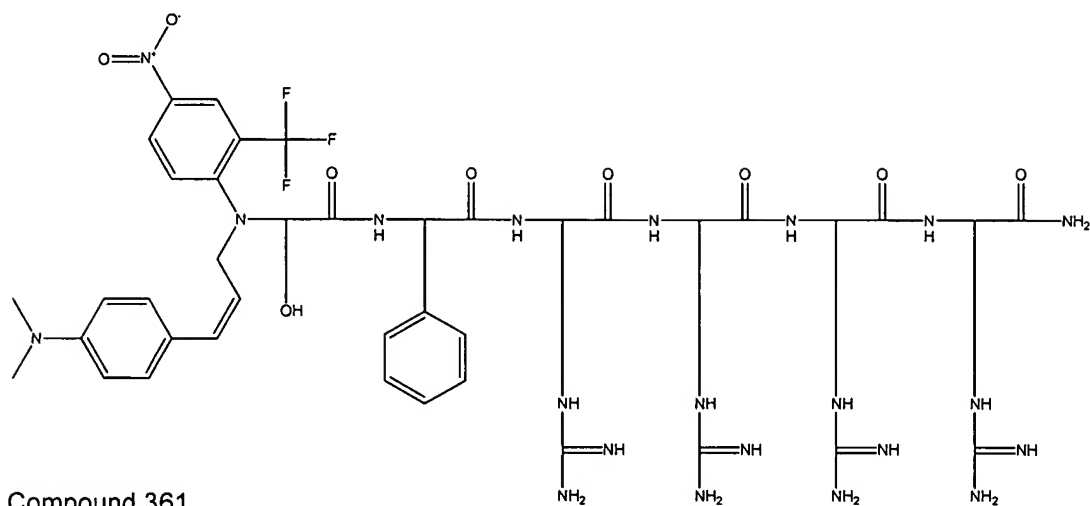
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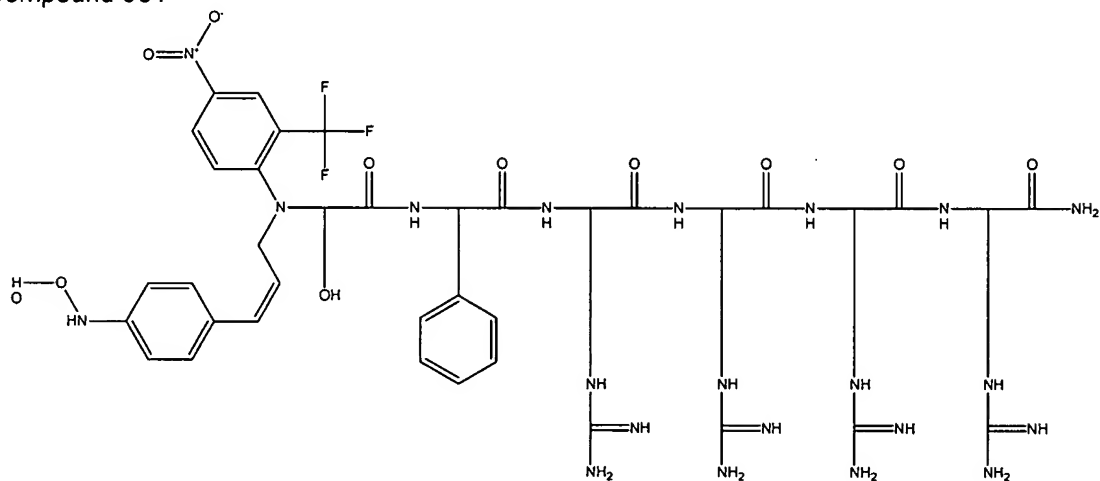
Compound 359



Compound 360

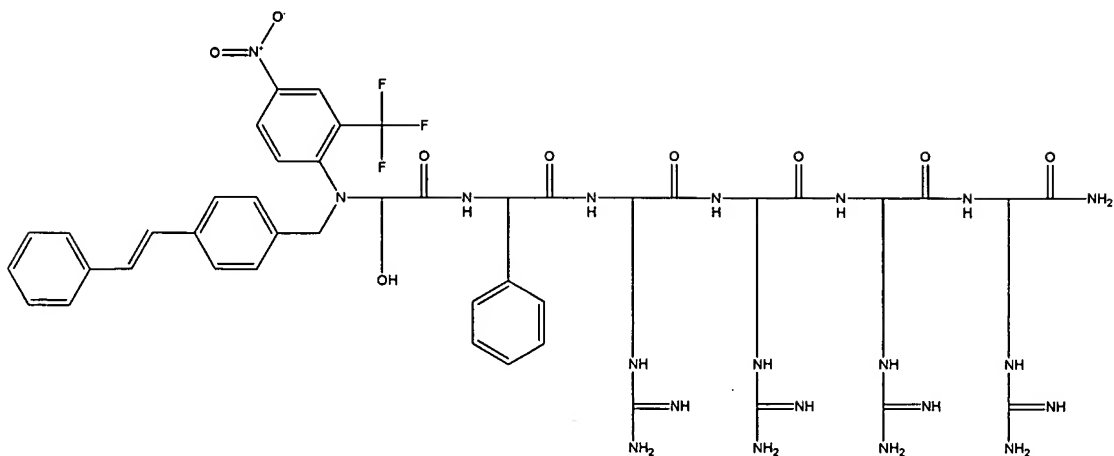


Compound 361

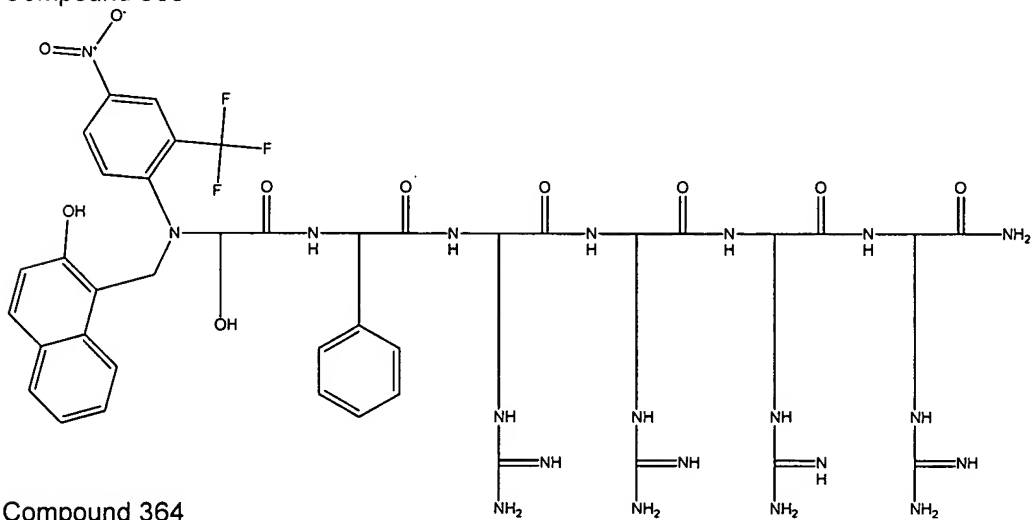


Compound 362

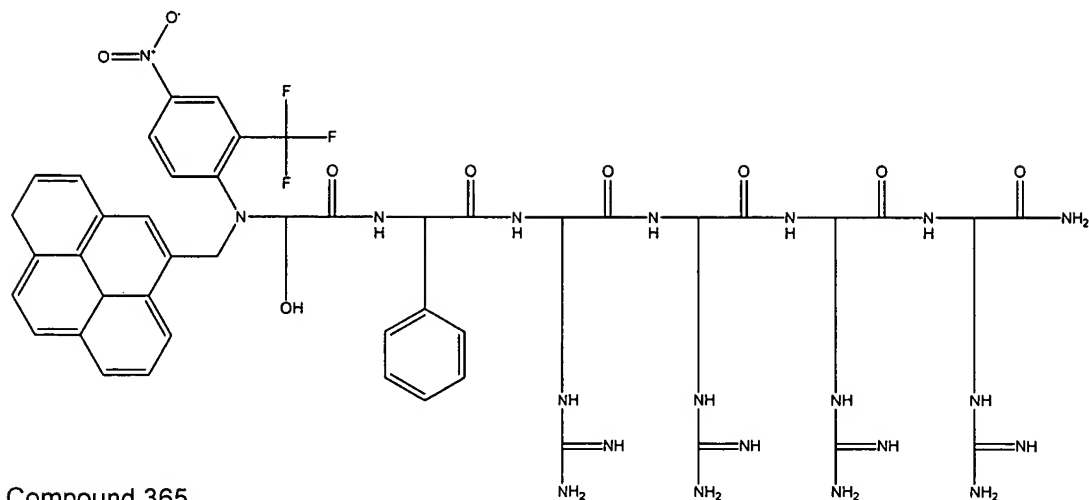
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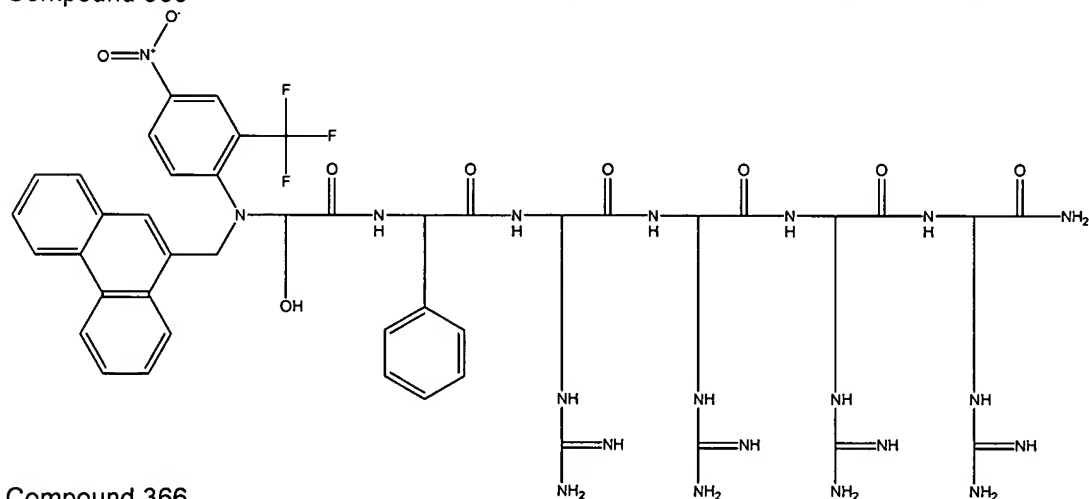
Compound 363



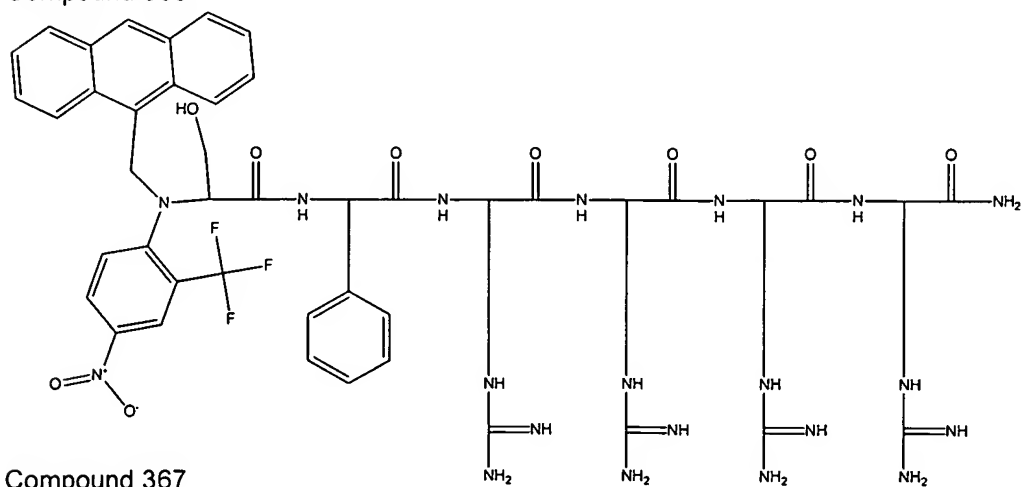
Compound 364



Compound 365



Compound 366



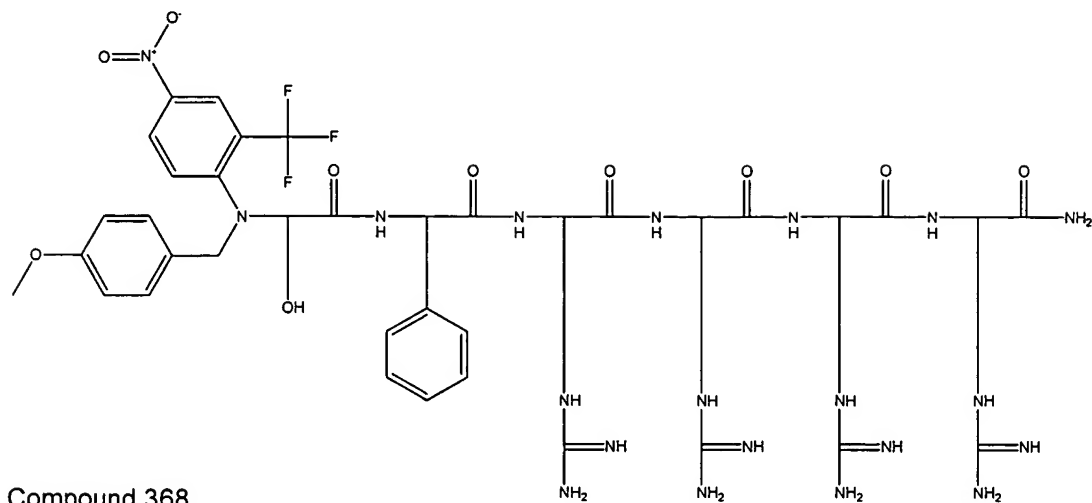
Compound 367

Applicant: David S. Lawrence

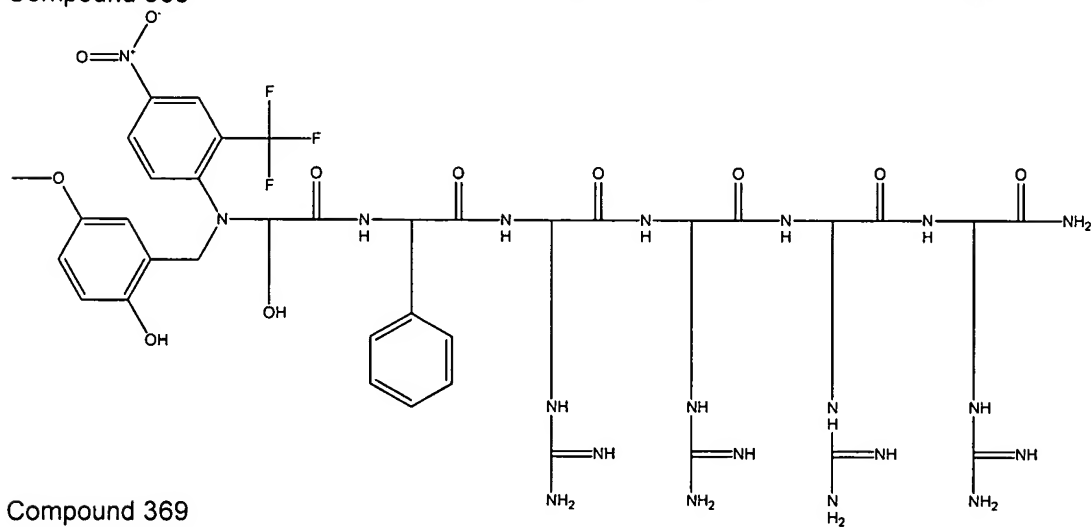
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Compound 368



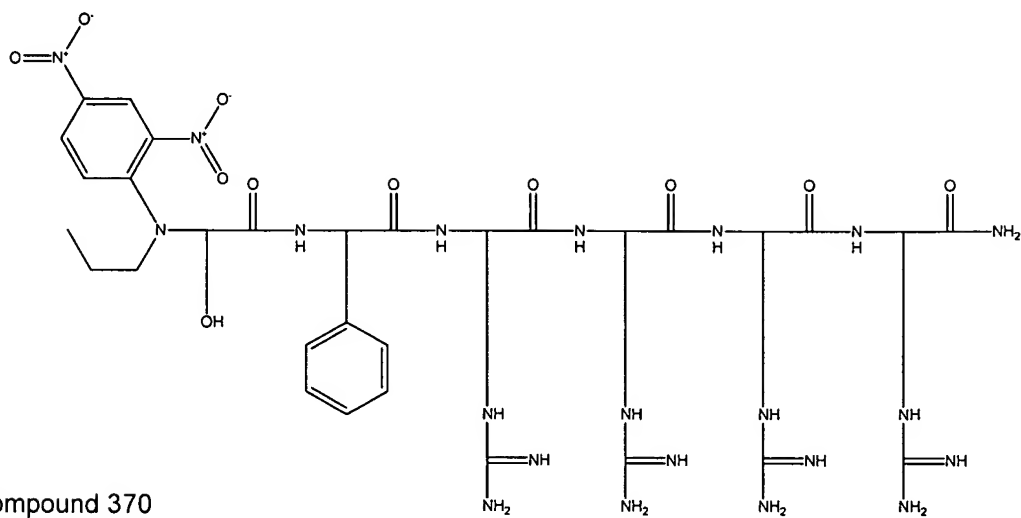
Compound 369

Applicant: David S. Lawrence

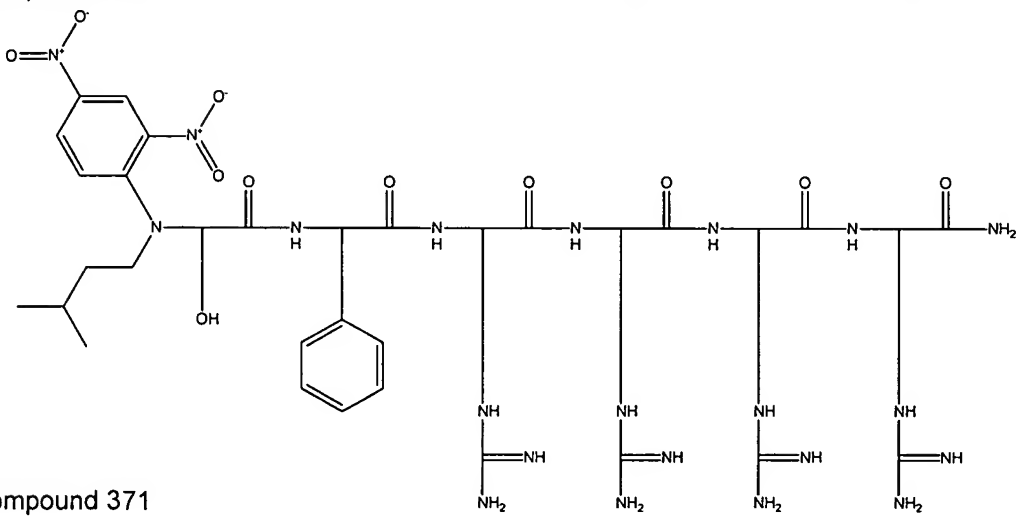
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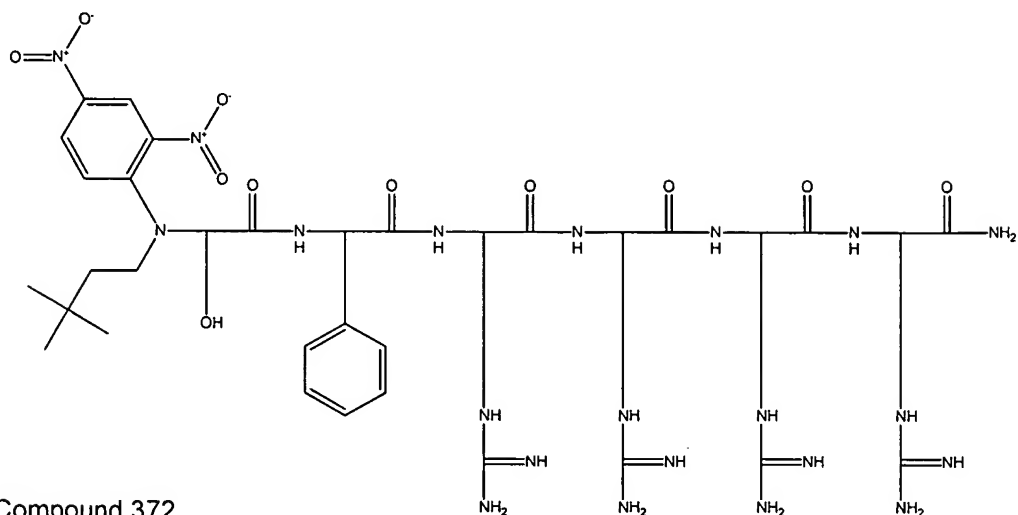
Compound 370



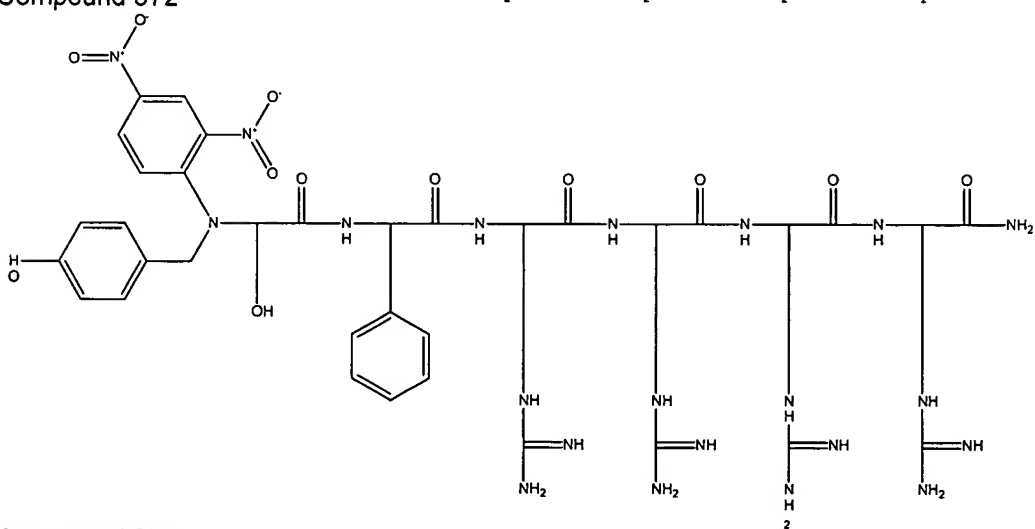
Compound 371



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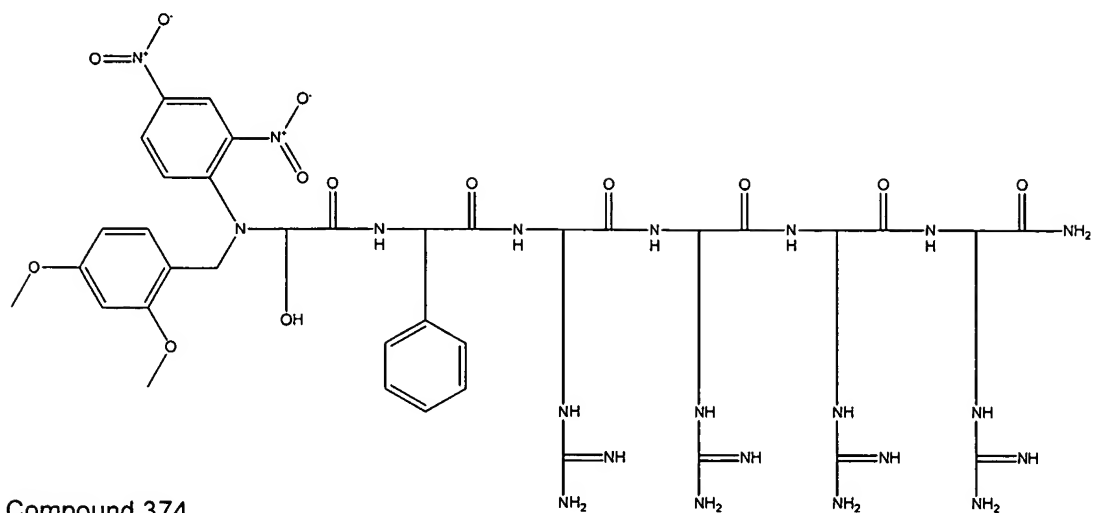


Compound 372

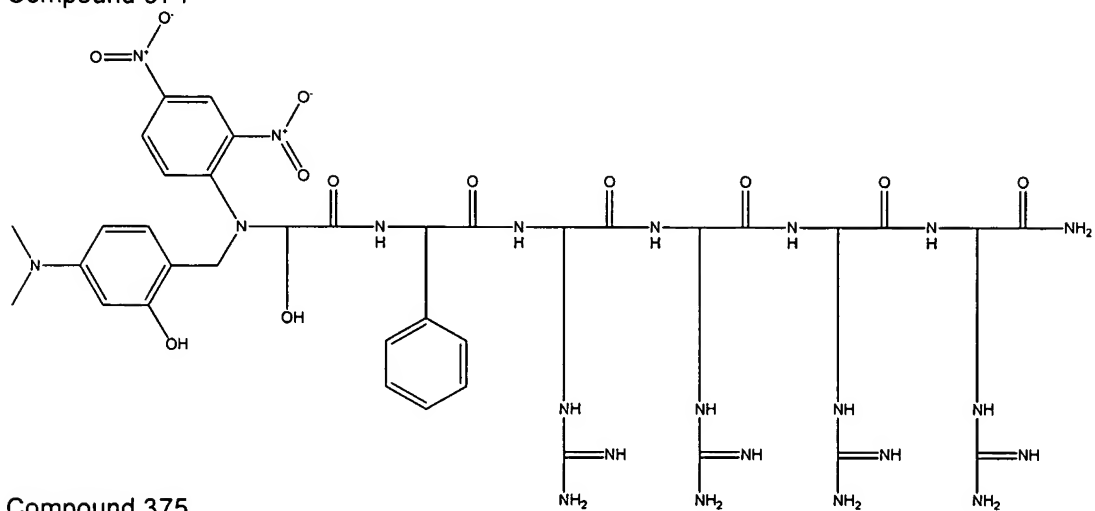


Compound 373

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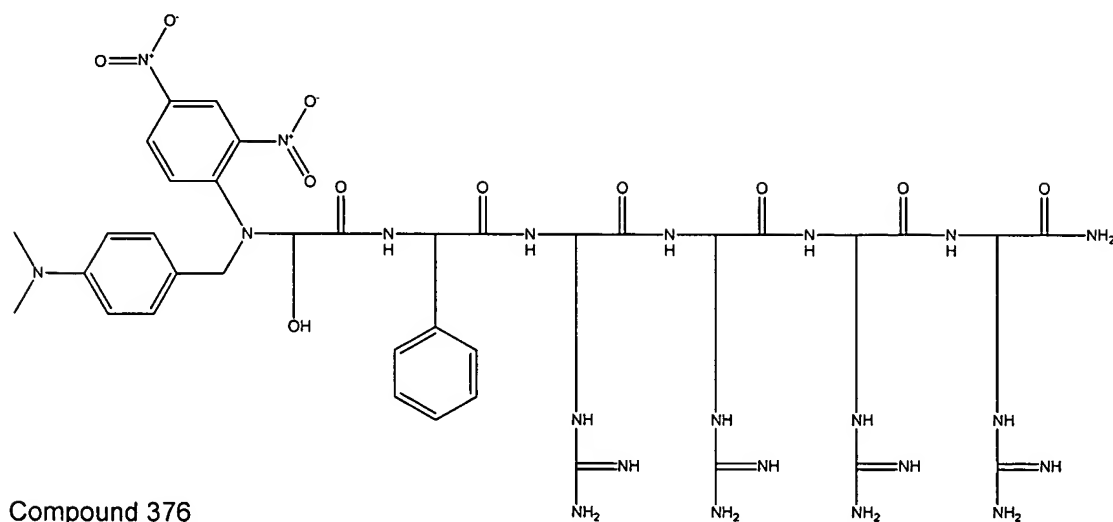


Compound 374

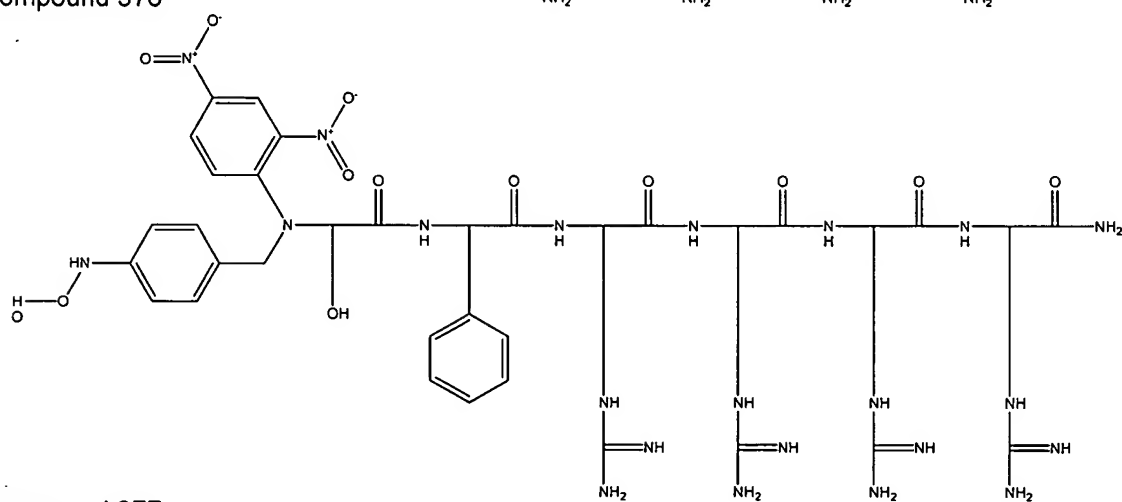


Compound 375

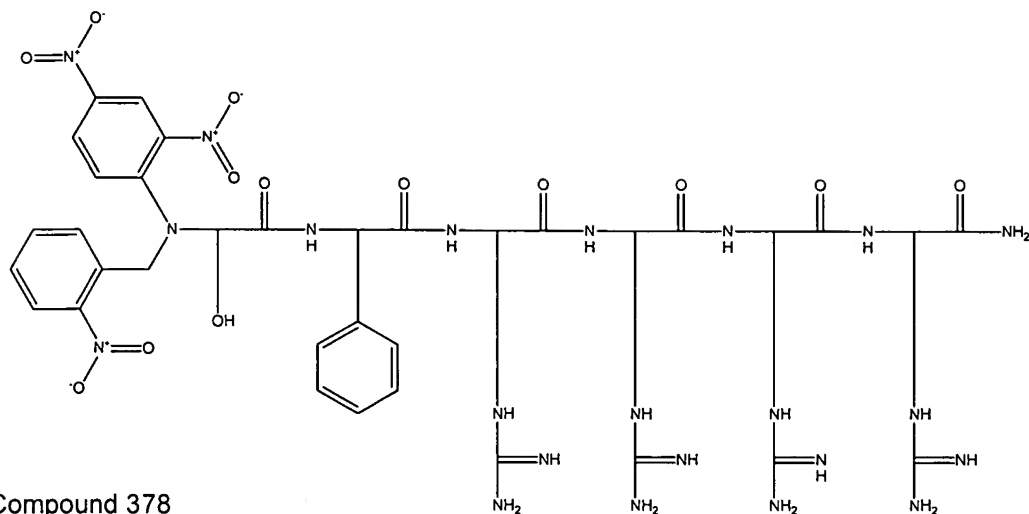
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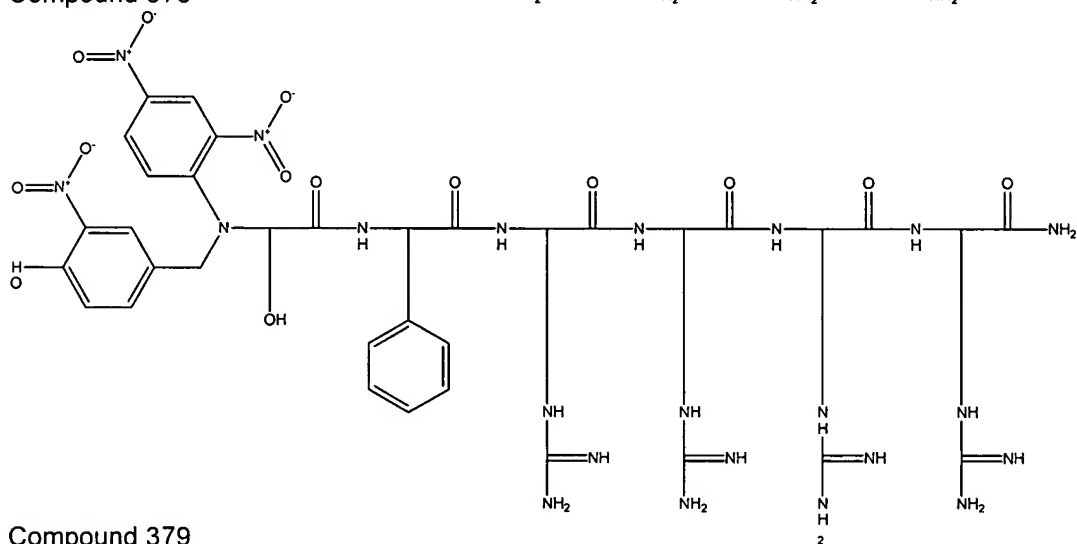
Compound 376



Compound 377

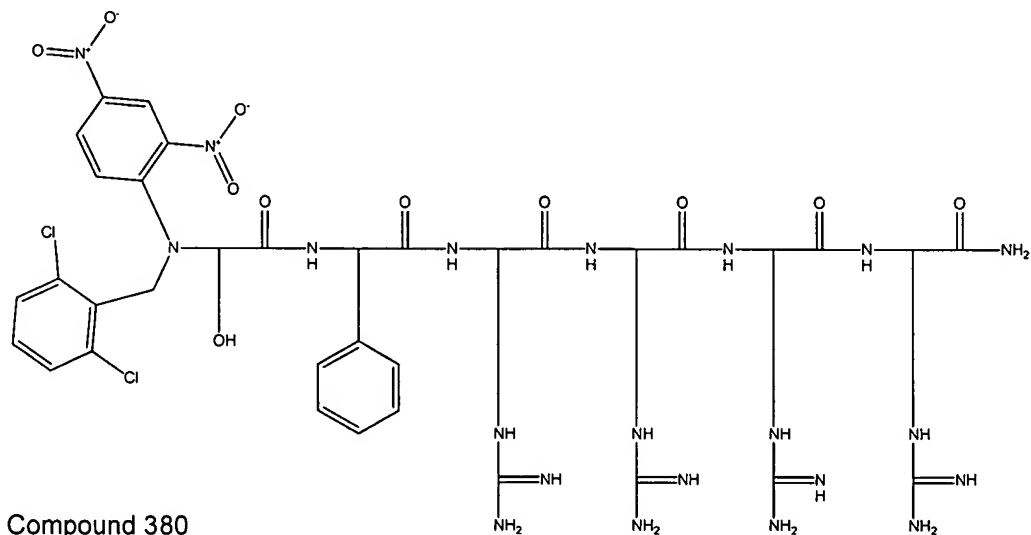


Compound 378

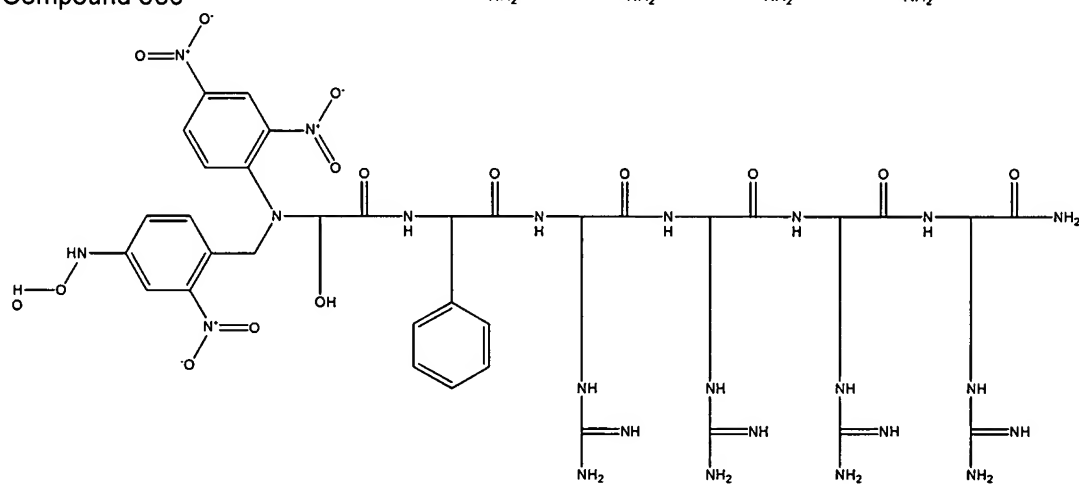


Compound 379

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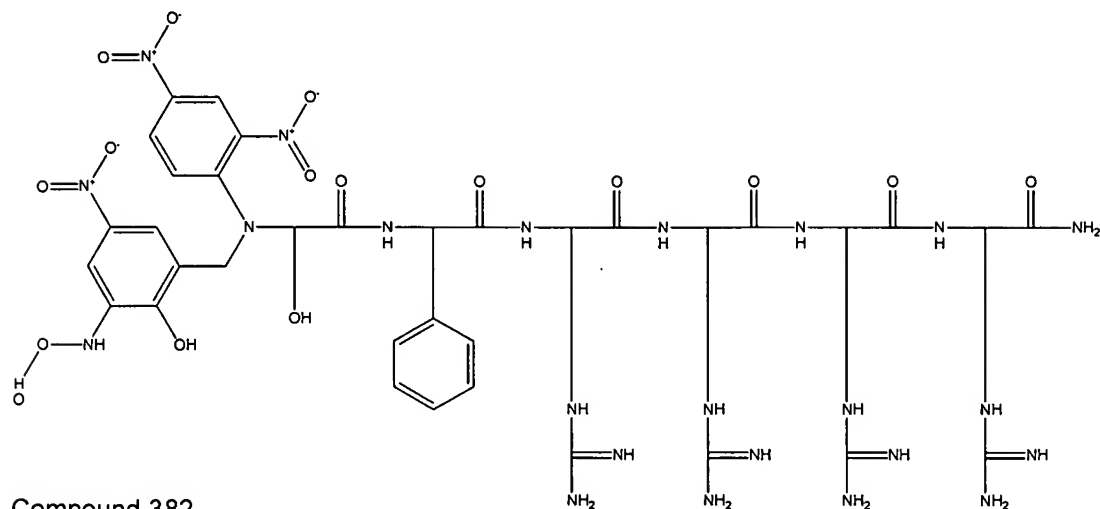


Compound 380

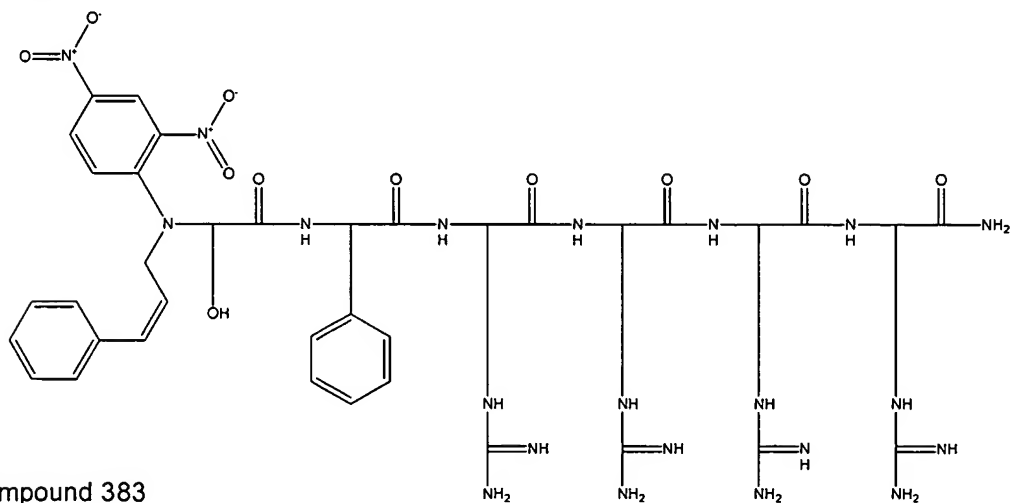


Compound 381

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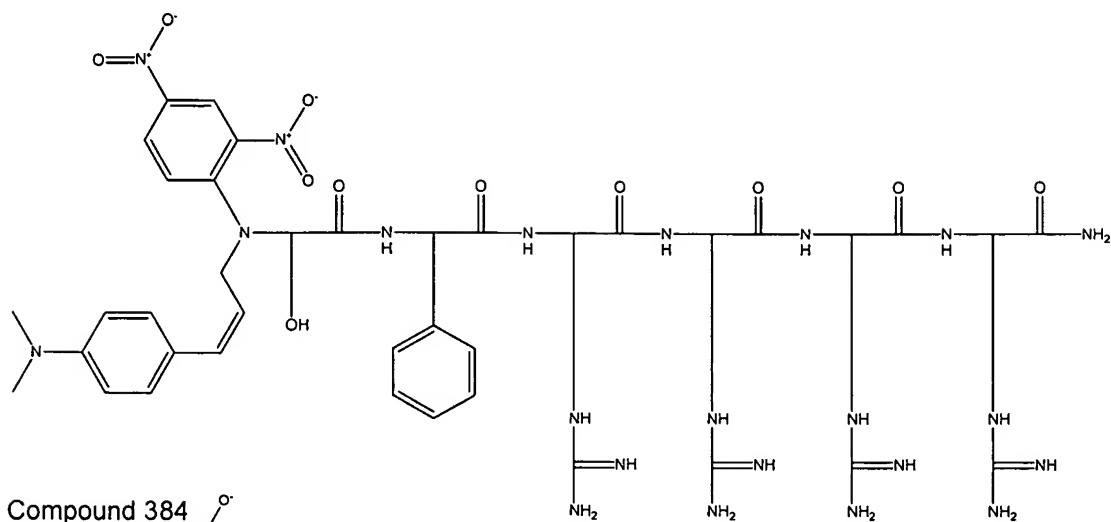


Compound 382

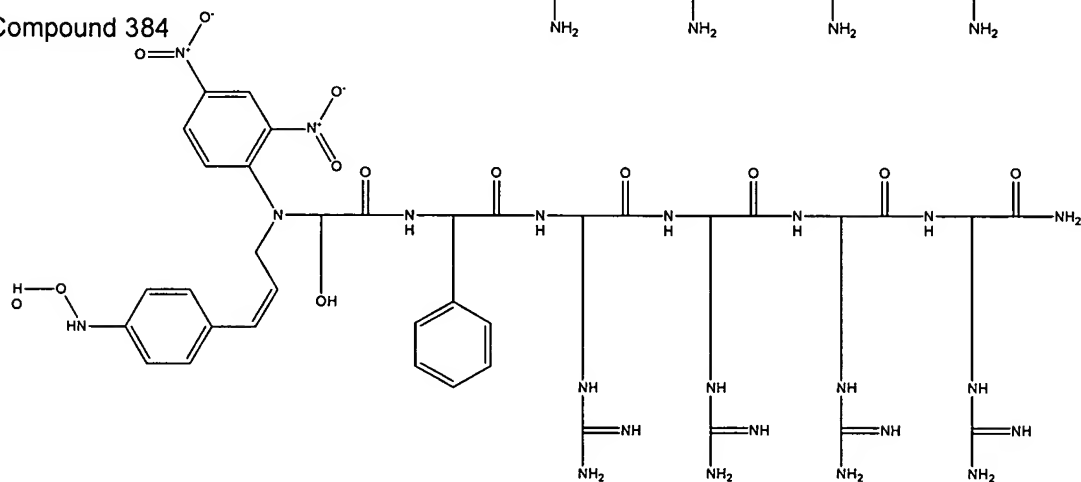


Compound 383

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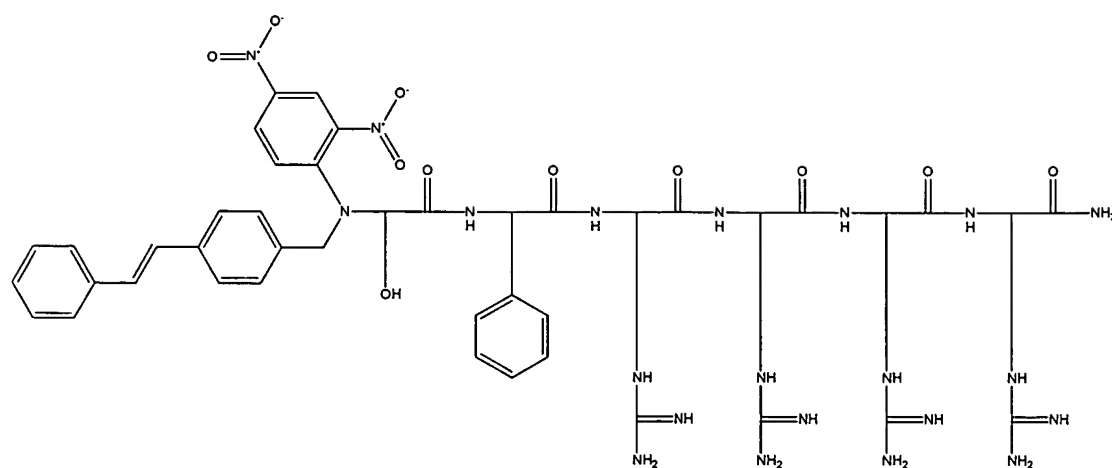


Compound 384

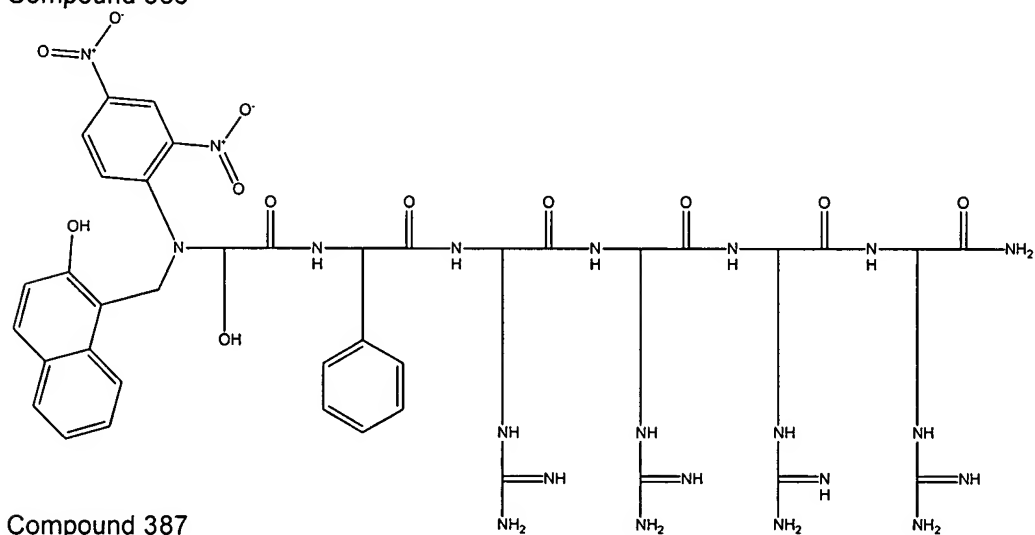


Compound 385

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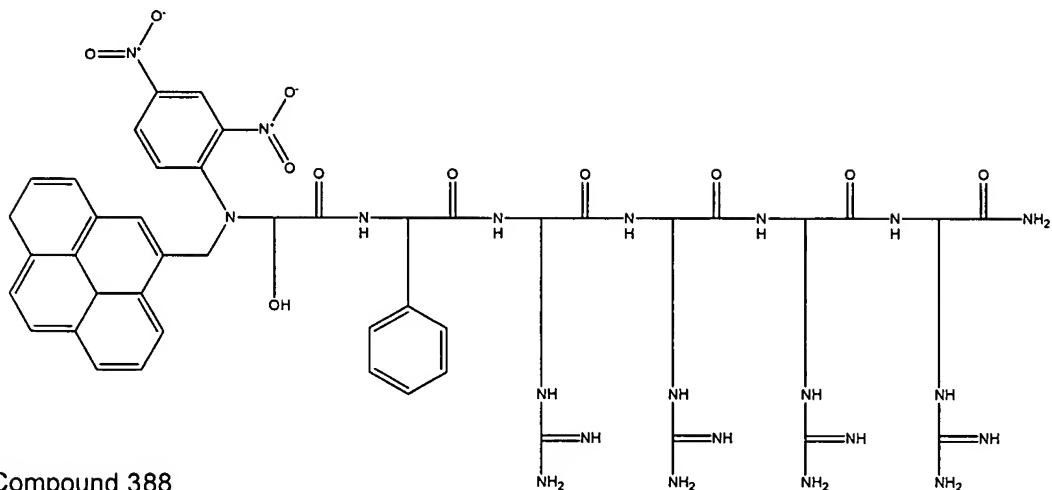


Compound 386

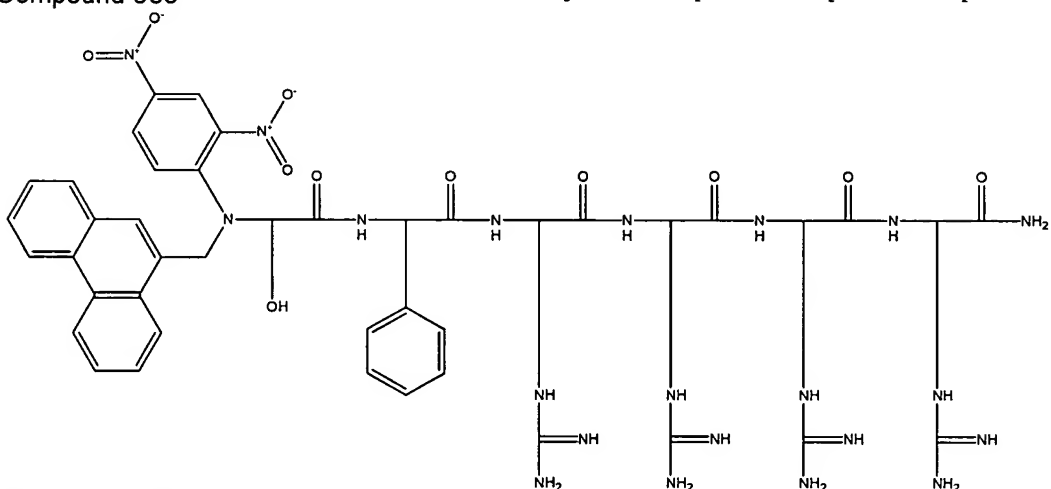


Compound 387

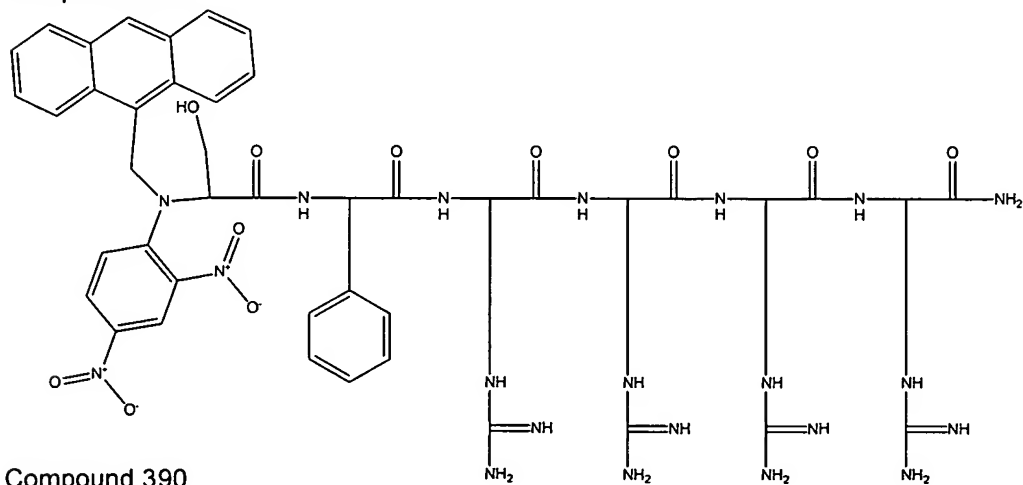




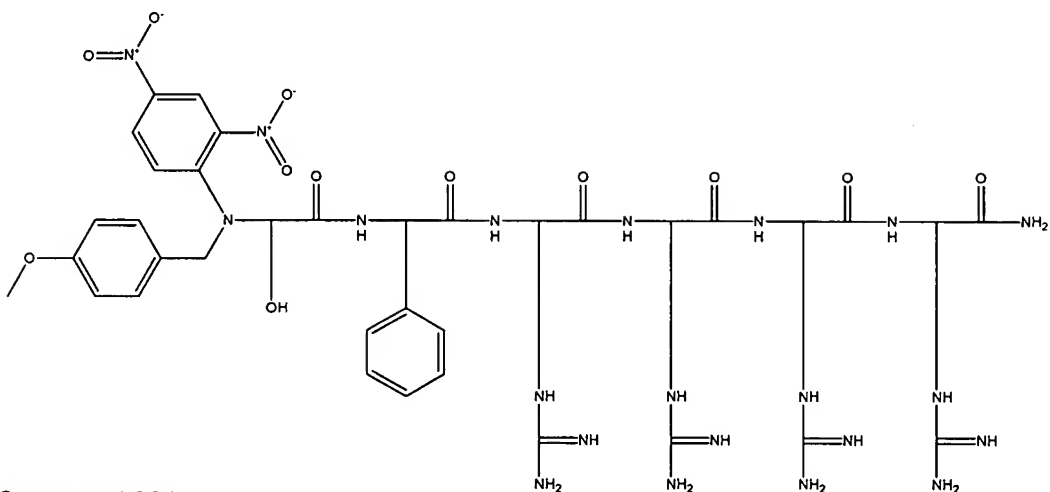
Compound 388



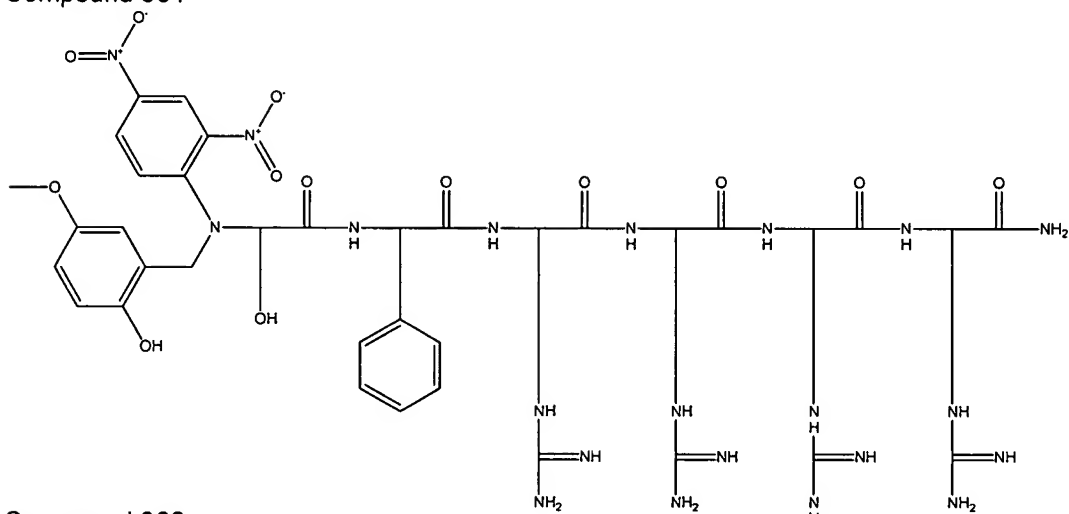
Compound 389



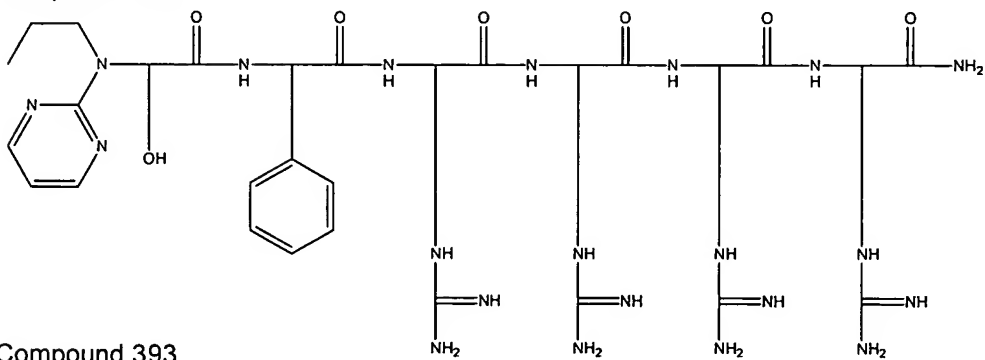
Compound 390



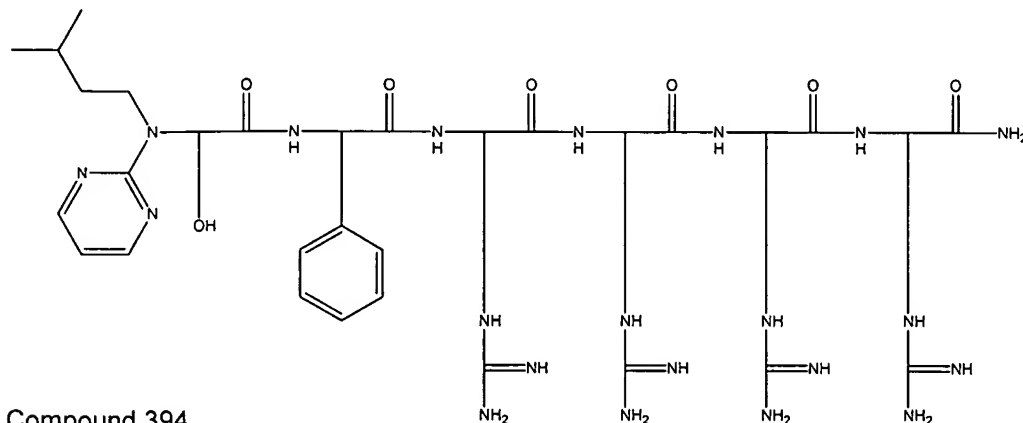
Compound 391



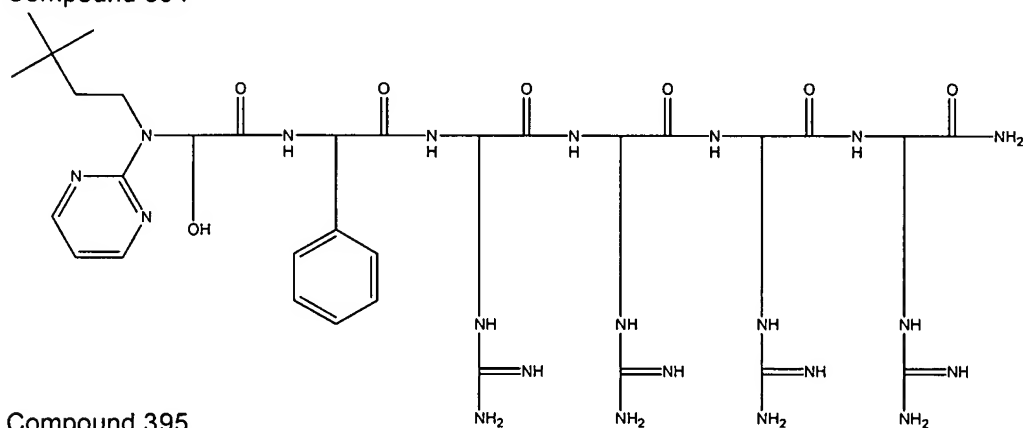
Compound 392



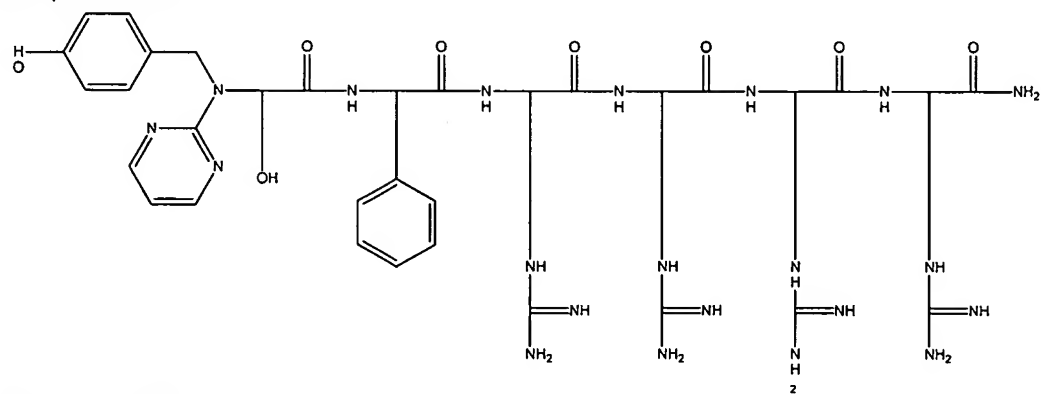
Compound 393



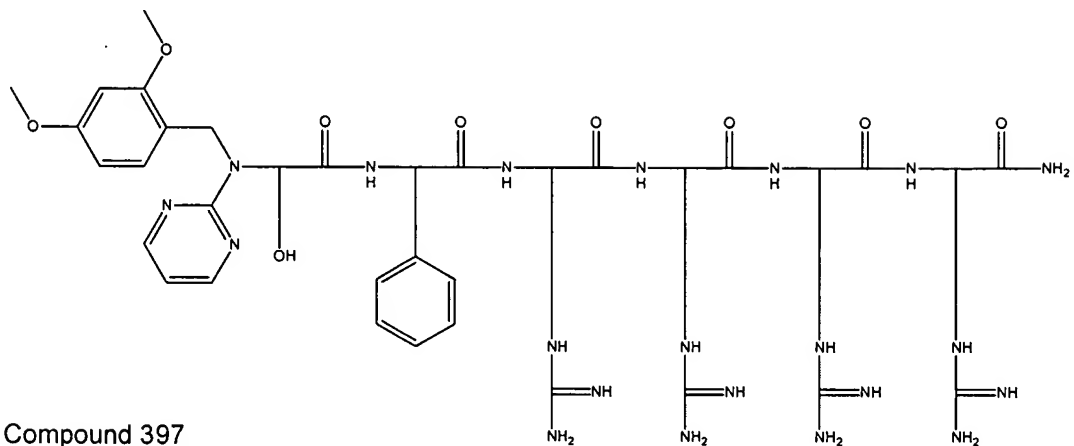
Compound 394



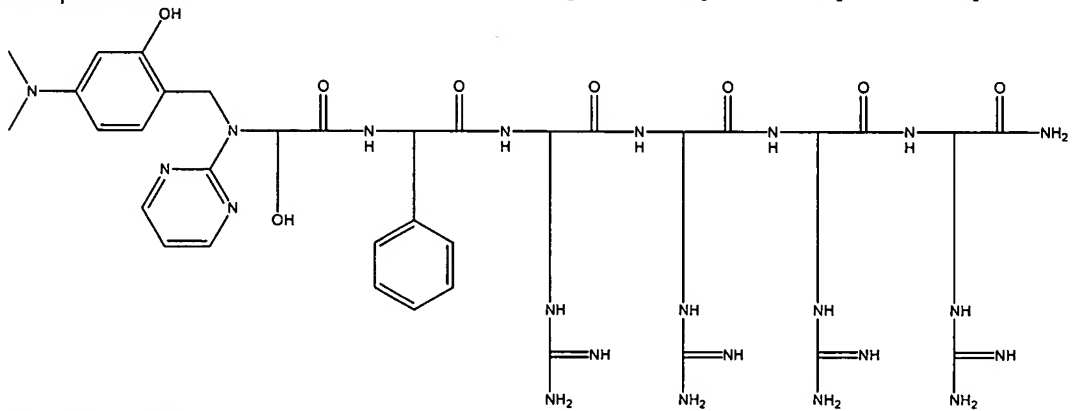
Compound 395



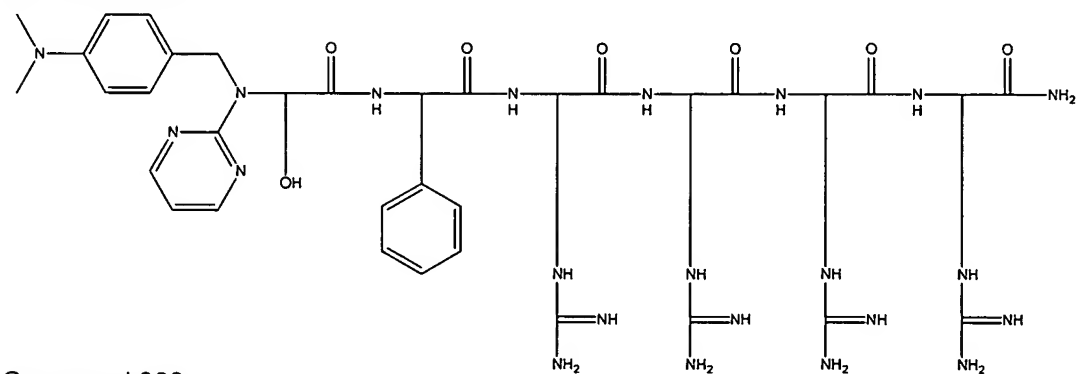
Compound 396



Compound 397

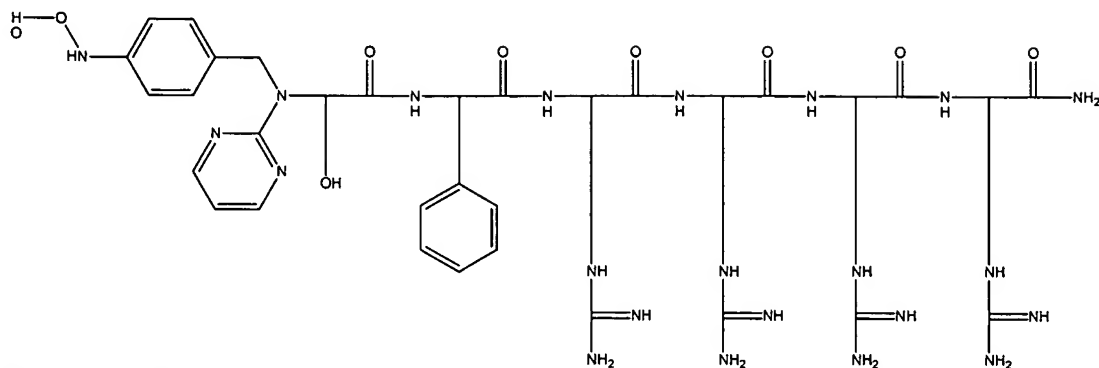


Compound 398

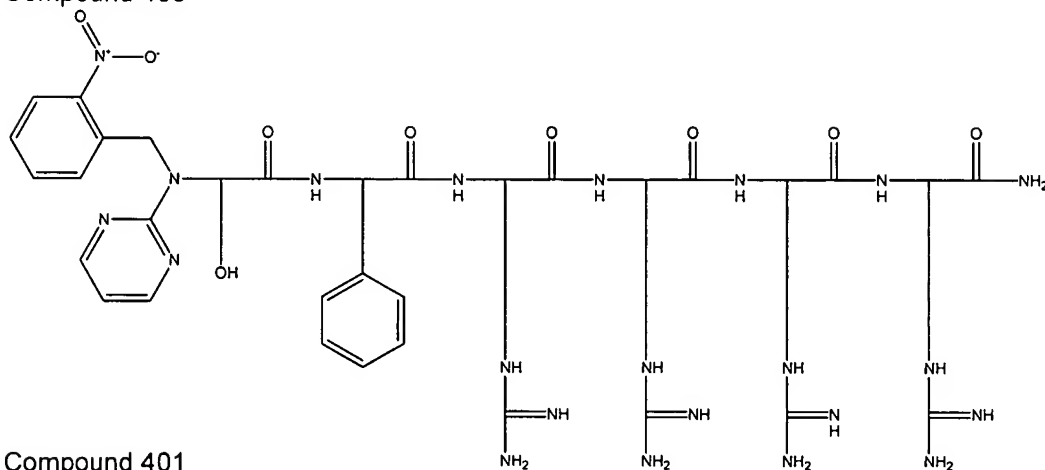


Compound 399

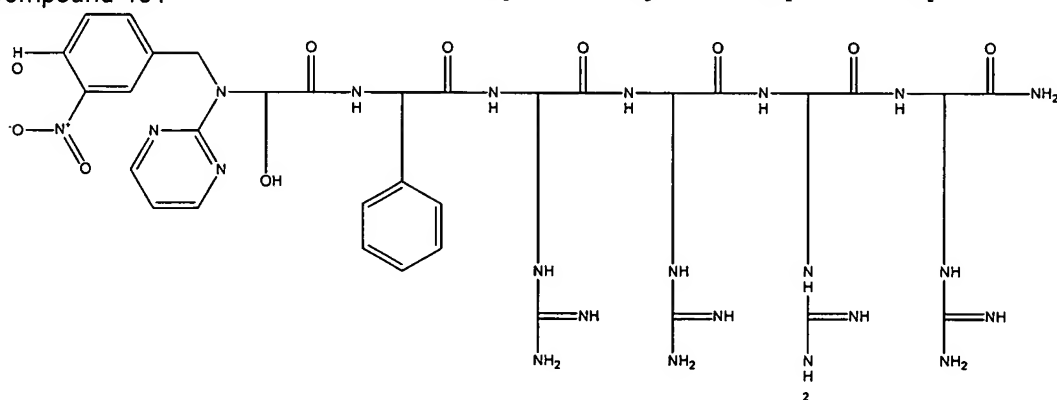
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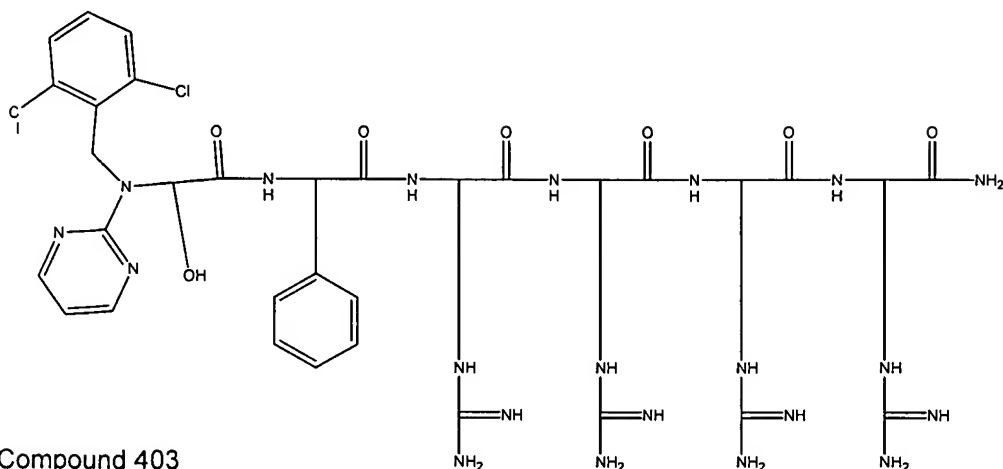
Compound 400



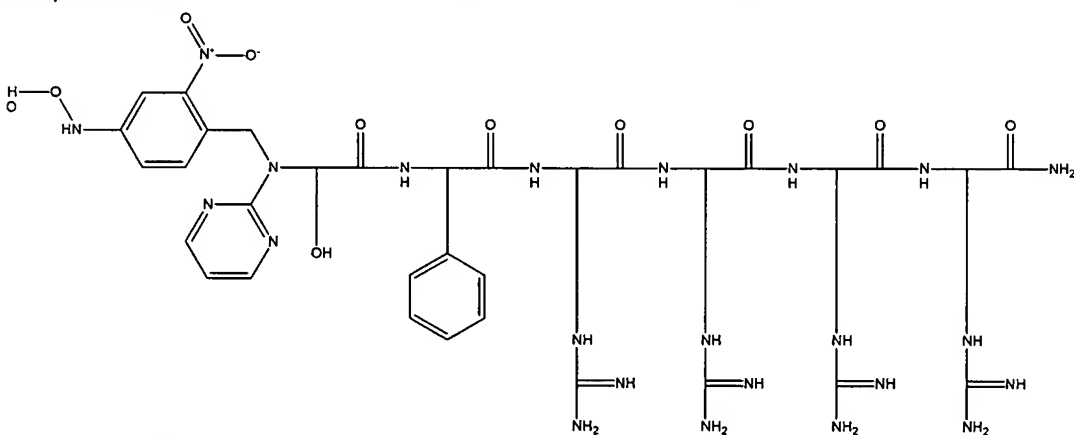
Compound 401



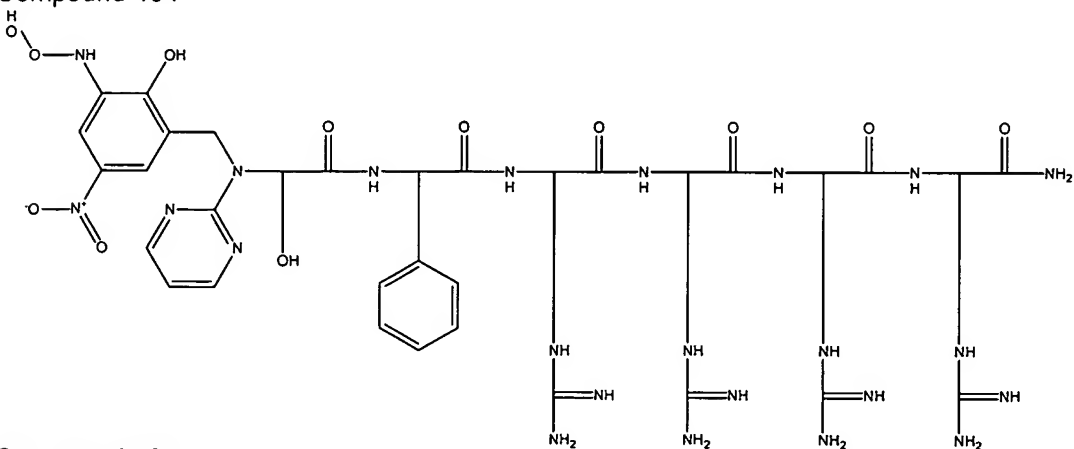
Compound 402



Compound 403



Compound 404



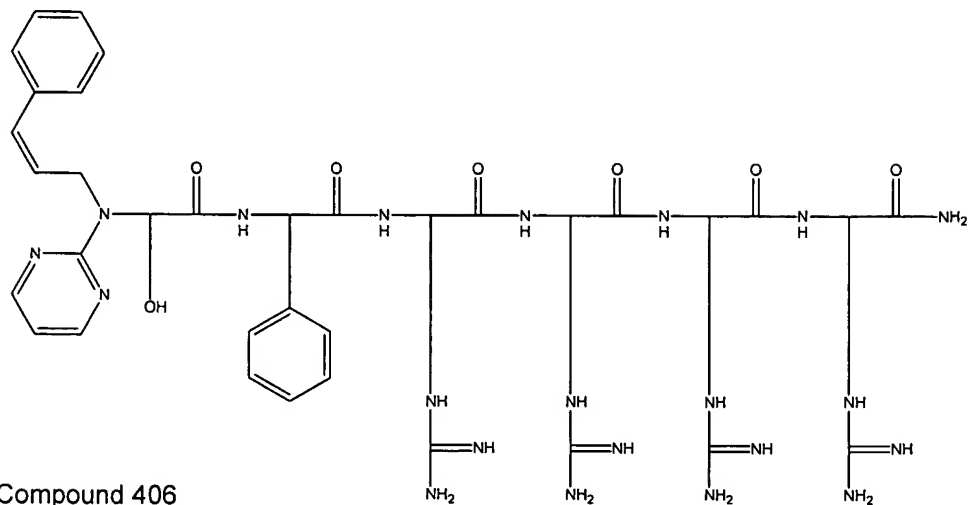
Compound 405

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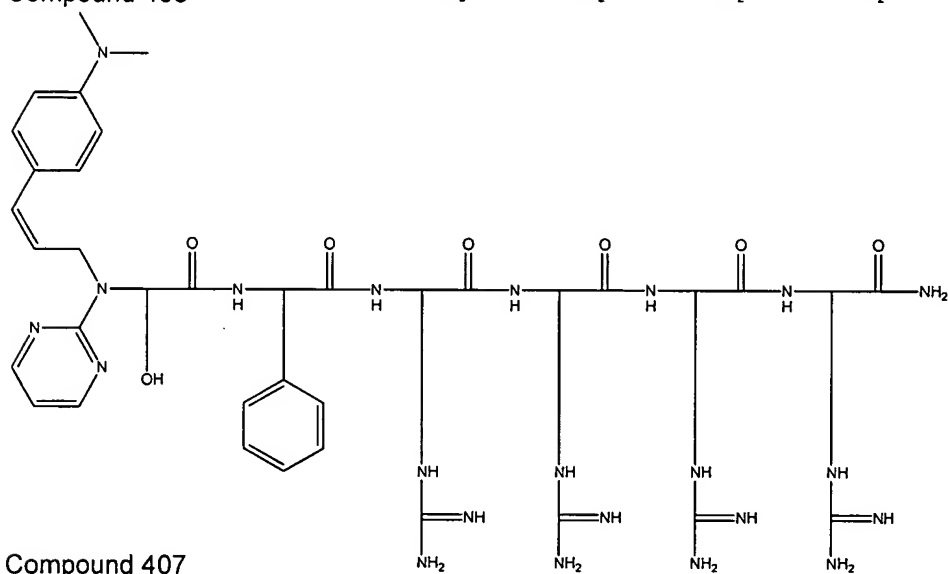
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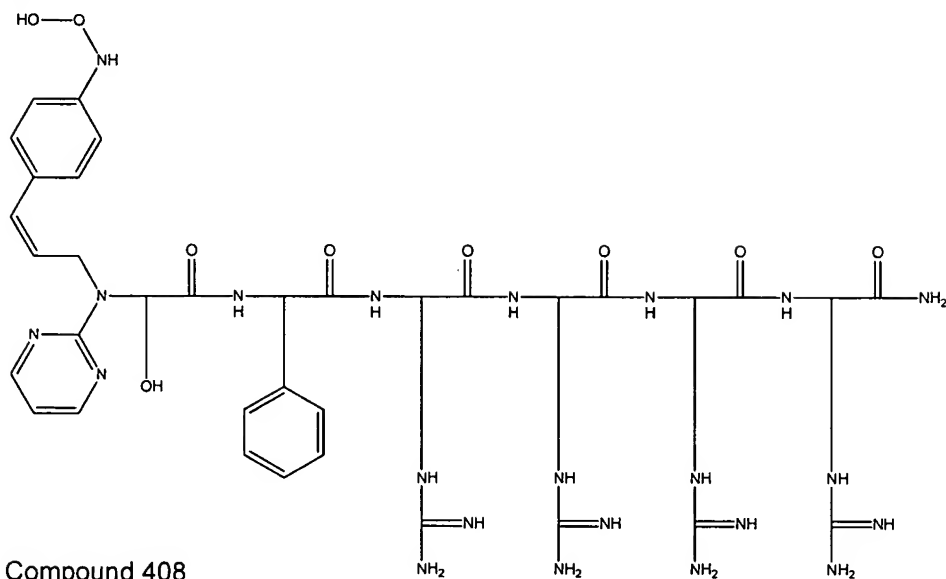
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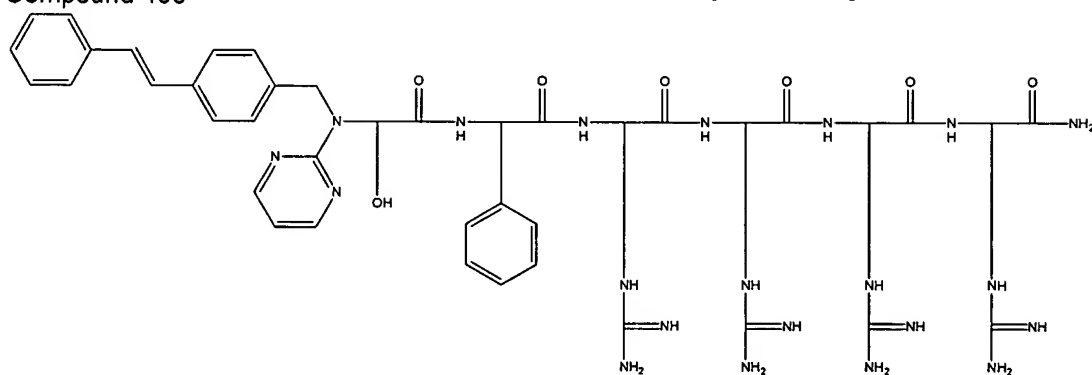
Compound 406



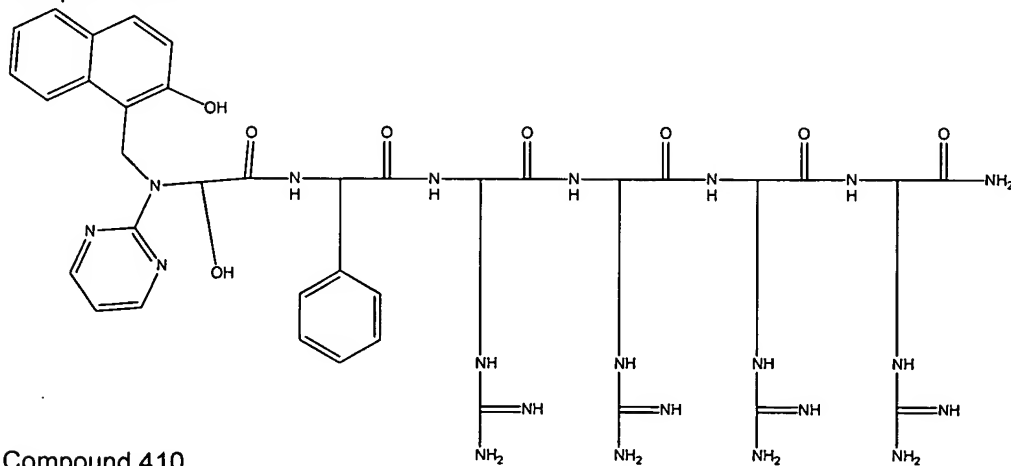
Compound 407



Compound 408



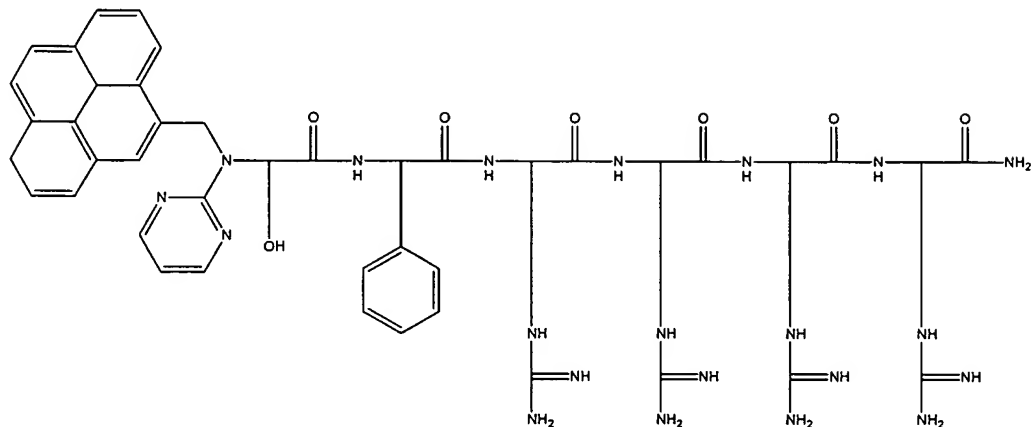
Compound 409



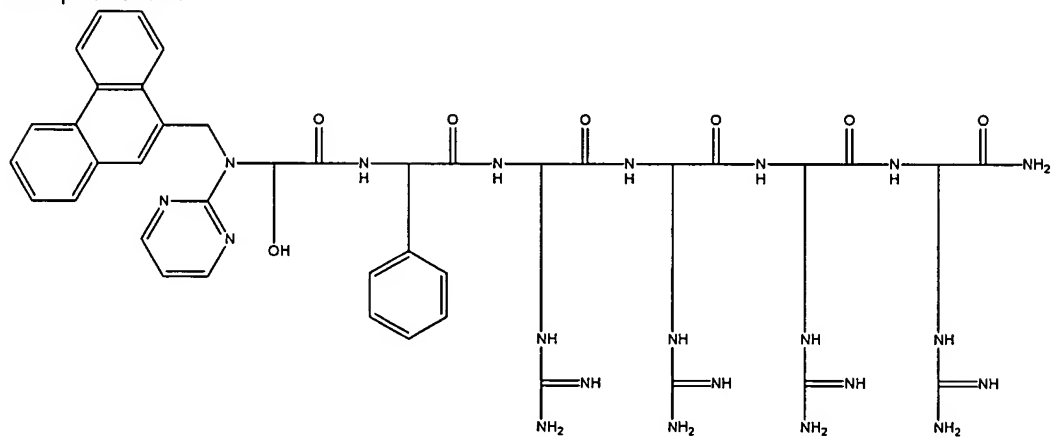
Compound 410



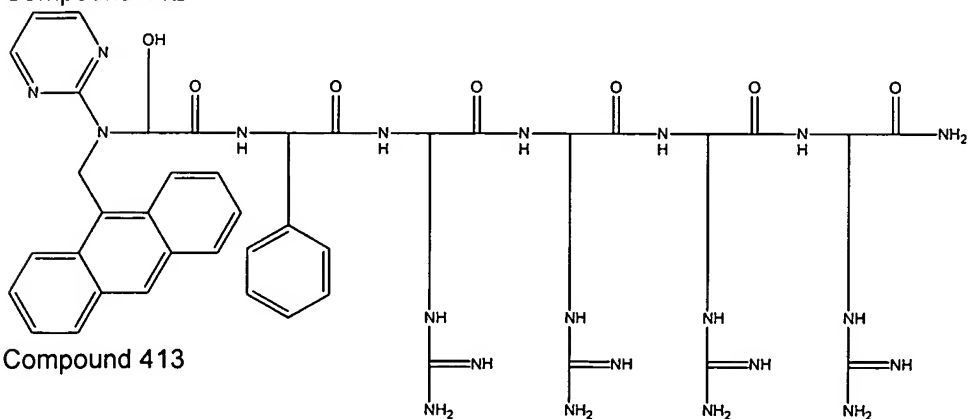
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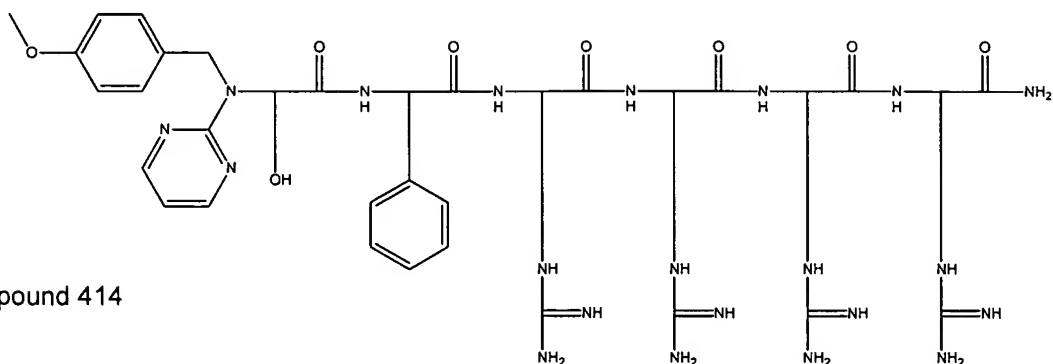
Compound 411



Compound 412

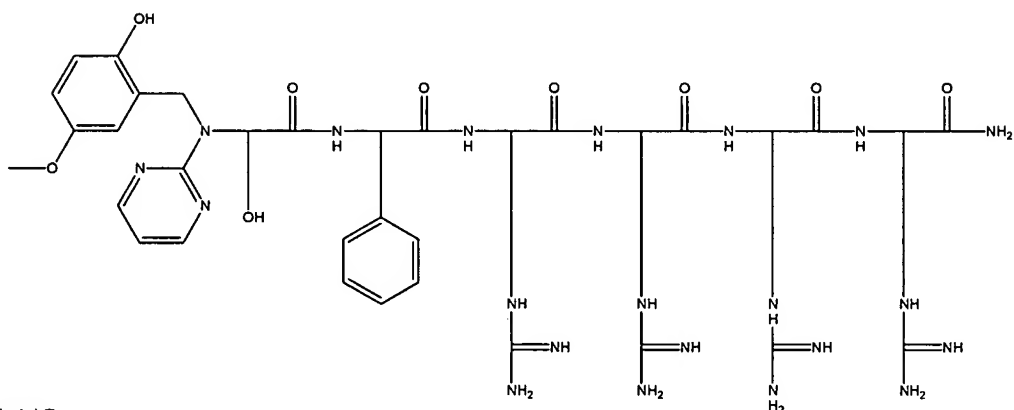


Compound 413



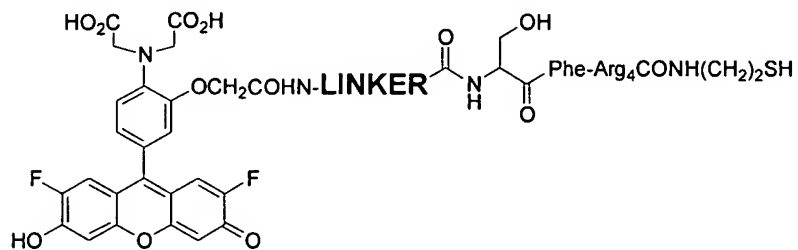
Compound 414

and

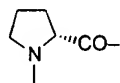


Compound 415

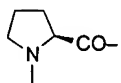
89. (Original) A chemical compound having the structure:



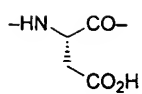
wherein the LINKER is selected from the group consisting of the following:



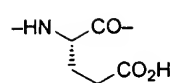
a



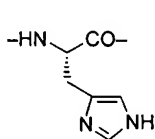
b



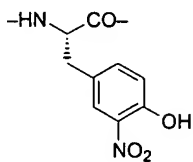
c



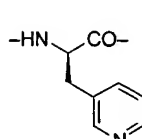
d



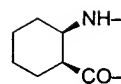
e



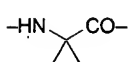
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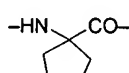
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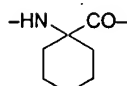
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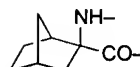
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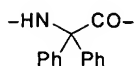
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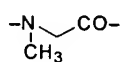
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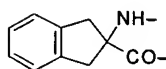
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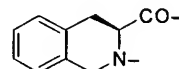
m



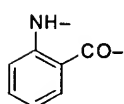
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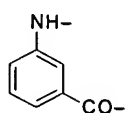
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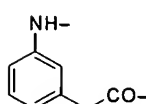
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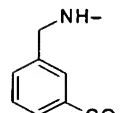
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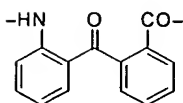
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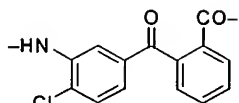
s



t



u



v

no linker

w

90. (Original) A chemical compound having the structure:

fluorophore-LINKER-X-FRRRRK-amide (SEQ ID NO:3);

wherein F is phenylalanine; K is lysine; R is arginine; and X is serine, threonine, or tyrosine.

91. (Original) The chemical compound of claim 90, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.

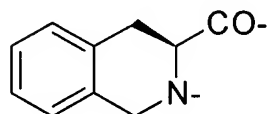
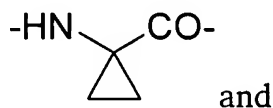
92. (Withdrawn) The chemical compound of claim 90, wherein the fluorophore is a fluorescein derivative.

93. (Withdrawn) The chemical compound of claim 90, wherein the fluorophore is selected from the group consisting of a dansyl derivative, an acridine derivative, an Alexa Fluor derivative, a BODIPY derivative, an Oregon Green derivative, a Rhodamine Green derivative, a Rhodamine Red-X derivative, a Texas Red derivative, a Cascade Blue derivative, a Cascade Yellow derivative, a Marina Blue derivative, a Pacific Blue derivative, an AMCA-X derivative, and a coumarin derivative.

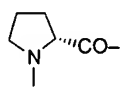
94. (Withdrawn) The chemical compound of claim 90, wherein the linker is a metal chelating linker.

95. (Original) The chemical compound of claim 90, wherein the linker is selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

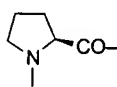
96. (Withdrawn) The chemical compound of claim 90, wherein the linker is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



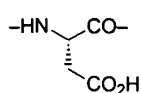
97. (Original) The chemical compound of claim 90, wherein the linker is selected from the group consisting of the following:



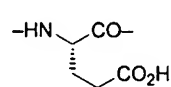
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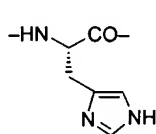
b



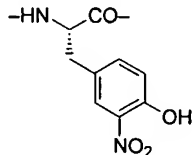
c



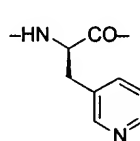
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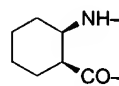
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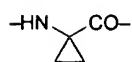
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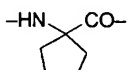
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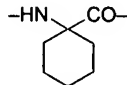
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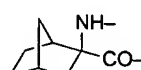
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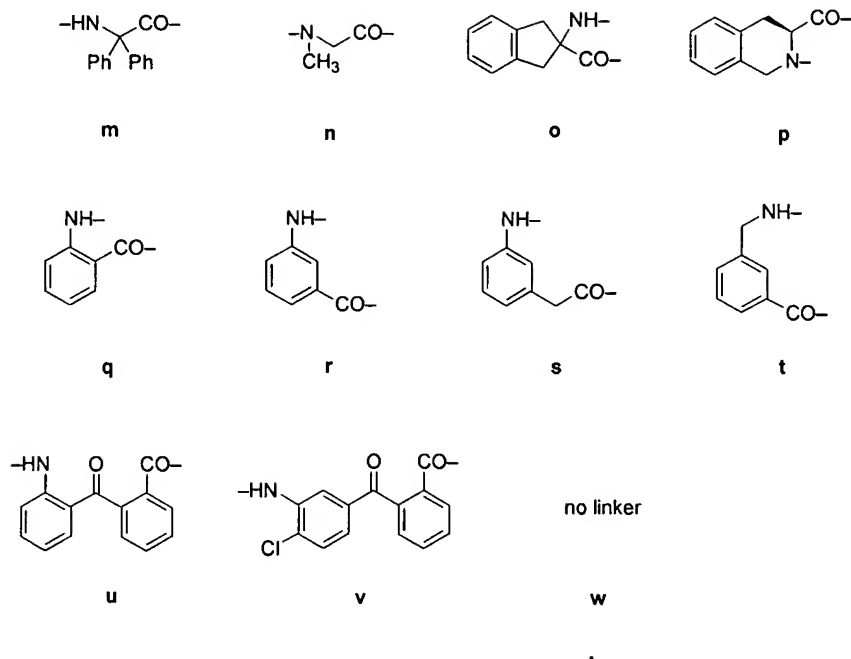
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k



l



98. (Original) The chemical compound of claim 90, wherein the chemical compound is a substrate for a protein kinase.

99. (Original) The chemical compound of claim 98, wherein the chemical compound is specific for protein kinase C.

100. (Original) The chemical compound of claim 99, wherein the chemical compound is specific for isoforms  $\alpha$ ,  $\beta$ , and  $\gamma$  of protein kinase C.

101. (Withdrawn) The chemical compound of claim 98, the chemical compound is specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G,  $\text{Ca}^{2+}$ /calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase

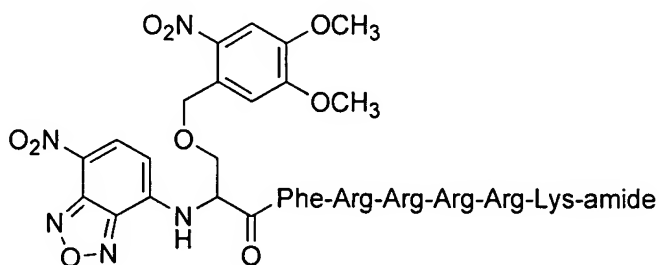
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src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2 kinase.

102. (Original) The chemical compound of claim 90, wherein the chemical compound further comprises a carbohydrate, a lipid or a nucleic acid.

103-121. (Canceled)

122. (Original) A chemical compound having the structure



123. (Previously presented) A composition comprising a chemical compound of claim 89, and a carrier.

124-126. (Canceled)

127. (Previously presented) The substrate of claim 60, wherein the substrate comprises a metal ion chelator.

128. (Original) The substrate of claim 127, wherein the metal ion is a magnesium ion or a calcium ion.

129. (Currently amended) The chemical compound of claim 90, ~~94~~, wherein a metal ion chelator induces a change in fluorescence intensity.

130. (Original) The chemical compound of claim 129, wherein the metal ion is a magnesium ion or a calcium ion.

131. (Original) The chemical compound of claim 129, wherein the change in fluorescence intensity is at least a 20% change in fluorescence intensity.

132. (Canceled)

133. (Currently amended) The chemical compound of claim 90, ~~substrate of claim 81~~, wherein the linker comprises a turn to position the fluorophore in a location closer to the ~~terminal~~ serine, the ~~terminal~~ threonine or the ~~terminal~~ tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

134. (Previously presented) The chemical compound of claim 89, wherein the linker comprises a turn to position the fluorophore in a location closer to the terminal serine, the terminal threonine or the terminal tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

135-136. (Canceled)

137. (Previously presented) The composition of claim 123, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically



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acceptable carrier.

138. (Previously presented) A composition comprising the substrate of claim 49, and a carrier.

139. (Previously presented) The composition of claim 138, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

140. (Previously presented) A composition comprising the compound of claim 88, and a carrier.

141. (Previously presented) The composition of claim 140, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

142. (Previously presented) A composition comprising the compound of claim 90, and a carrier.

143. (Previously presented) The composition of claim 142, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

144-145. (Canceled)

146. (Previously presented) A composition comprising the compound of claim

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122, and a carrier.

147. (Previously presented) The composition of claim 146, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.